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STEEL - SERVICE

The Week in Perspective

INDUSTRY must continue to watch labor relations developments carefully. The strategy of the professional union leaders probably will be to work hard to recruit new members during the summer, and to renew the demand for recognition at an opportune time later in the year. Meanwhile, the makeshift machinery hastily thrown together to cope with the recent strike threat appears to be destined to grind slowly and ponderously for an indefinite period. The precedent of the automobile industry settlement, the proposed mediation board for the steel situation and the act substituted for the Wagner bill give all parties ample leeway to keep all controversies in the midchannel of ambiguity. Nothing has been settled; the issue has been evaded.

Pity the Poor General—Unwittingly He Tastes a Dose of His Own Medicine!

Every employer in the country must have enjoyed a hearty chuckle over the predicament of General Johnson when professional labor leaders and congressmen jumped upon him for firing an NRA employe, identified with the American Federation of Government Employes, for inefficiency. The General now is up against one of the problems he has helped to thrust upon every employer. The experience should help him to understand how difficult it is for employers to get rid of worthless, trouble-making idlers who attempt to gain protection under the skirts of Section 7a. If the General fired a really competent man for union affiliation, than he is guilty of the charge he so frequently hurls at industry.

Purchasing Agents Stage Fine Convention; NRA Spokesmen Uncertain of Policies

Walter S. Tower, executive secretary of the American Iron and Steel institute, made an excellent impression at the Cleveland convention of purchasing agents. He clarified certain changes in the steel code and won new respect for its administration. The convention (p. 19) and the Inform-a-Show (p. 38) of the National Association of Purchasing Agents probably were the best in the history of that organization. The program brought out a spirited debate upon the advantages and disadvantages of NRA. This afforded an exceptional opportunity for NRA representatives to present the government's viewpoint. Several of them did so, but not emphatically enough to offset the sour note introduced by a few NRA officials, who used their allotted time to throw mud at industry. Purchasing agents went away with the impression that NRA spokesmen are hopelessly confused and that their efforts lack unity of purpose.

Warnings of Shortage in Technically Trained Men Emphasize Personnel Problem

Plant managers who have experienced difficulty during the past six months in finding a sufficient number of highly skilled workmen to satisfy conditions under NRA codes will be interested in the statement of the president of an eastern technical school that industry faces a severe shortage (p. 36) of technically trained men. He recalls that 15 months ago James A. Farrell issued a similar warning. The former president of U. S. Steel predicted the shortage would affect all occupational levels from machinists and other skilled workers to research men with doctors' degrees. Current evidence seems to show that Mr. Farrell's prediction was right. Alert executives will do well to begin at once to solve the acute personnel problem created by the four-year stoppage of the infusion of new blood into industry. Rehabilitation of manpower is more vital than rehabilitation of equipment.

New Uses of Steel and Encroachments of Other Materials Enlivens Merchandising

Count that day lost on which somebody does not find a new use for steel! A Detroit manufacturer has developed a new guard for railroad grade crossings (p. 32), which, if widely adopted, would create an important new outlet for steel channels, floor plates, strip, shafting and coiled springs. The offset to new markets for steel is the constant encroachment of other materials. Ford's exhibition building at the Century of Progress exposition employs chrome-plated copper (p. 31) as the dominant note in decoration, thus writing a new verse to the current chapter of rivalry between stainless steel and chromium-plated nonferrous metals.

New Board, Secretary Perkins, To Administer Steel Labor

WASHINGTON, Friday: NEXT move in the steel labor situation probably will be the issuance of an executive order by the President, prior to his departure Tuesday on a Caribbean and Pacific cruise, creating a labor board of three members for the steel industry.

Contrary to newspaper reports, the American Iron and Steel institute, spokesman for the industry, does not have before it officially the program adopted by the Amalgamated Association of Iron, Steel and Tin Workers at Pittsburgh June 15 when it called off the steel strike scheduled for June 16.

This program. substantially that printed in STEEL for June 18, page 14, was placed before the President last Tuesday by a delegation of the Amalgamated, which achieved an ambition by gaining admission to the White House. It was then transmitted to Secretary of Labor Frances Perkins, where it now rests.

Await Board Personnel

Although Donald Richberg, NRA chief counsel and a government representative on the steel code, met Thursday with the institute, he did not formally place any program before it. The degree of co-operation which the industry manifests toward the steel labor board undoubtedly will be determined by the personnel of the board.

Steel labor relations took an entirely new turn in the past week. Shortly after the Amalgamated convention at Pittsburgh voted to postpone the steel strike and approved a board of three, congress by joint resolution empowered the President to create impartial boards for various industries.

This resolution the President signed last Tuesday, and immediately thereafter he placed Secretary Perkins, first woman cabinet member, in complete charge of all labor matters for the administration. This definitely removes NRA Administrator Johnson from the labor picture, outmodes the national labor board, and also shelves Sen. Robert F. Wagner for the time being, at least. (see also p. 13).

Whether this choice of Miss Perkins as labor dictator is a happy one for steel remains to be seen. She feels that steel has done a splendid job in safety and sanitation but still is archaic in its direct relations with labor.

While the labor board the President is expected to name early this week will be independent, nevertheless, the department of labor for the first time in the Roosevelt administration is defintely in the ascendancy in labor matters.

After the Amalgamated voted June 15 to abandon the strike, on receiving what amounted to an ultimatum from William Green, president of the American Federation of Labor, it sent a delegation to Washington.

The Amalgamated's program, calling for a labor board of three with broad power to mediate in all disputes, hold elections and require majority representation of employes, was laid before the President, who promptly transmitted it to Miss Perkins. There it rests, and there is no compulsion on the steel industry to act on it or even recognize it. The appointment of a steel labor board cleans the slate.

Prior to the Amalgamated convention, steel executives accepted a proposal of General Johnson to set up an impartial labor board. Executives, however, are opposed to holding new elections, when 85 per cent of eligible employes have voted within the past fortnight for representatives on works councils, and they also are opposed to majority representation. In fact, nothing to indicate any recognition of the union has been done.

Powers Are Defined

The new deal in labor in all industry—steel is in the foreground only because the situation has been stirred up there—is based on the joint resolution. Under it, the President may appoint boards for all industries. The power of these boards is stated thus:

> Any board so established is hereby empowered, when it shall appear in the public interest, to order and conduct an election by a secret ballot of any of the employes of any employer, to determine by what person or persons or organization they desire to be represented in order to insure the right of employes to organize and to select their representatives for the purpose of collective bargaining as defined in section 7a of said act and now incorporated herein.
>
> For the purposes of such election such

THE LABOR FRONT IN WASHINGTON: This concentration of leaders in the steel strike situation is in Secretary of Labor Perkins' office. At the left is Edward F. McGrady, ace lobbyist of the American Federation of Labor and now assistant to Miss Perkins. Left to right, after Mr. McGrady and Miss Perkins, are Louis Leonard, secretary-treasurer of the Amalgamated Association of Iron, Steel and Tin Workers; Michael F. Tighe, president of the Amalgamated, and William Green, president of the American Federation of Labor. Standing, left to right, are Edward W. Miller and Thomas G. Gillis, both vice presidents of the Amalgamated. Acme photo

a board shall have the authority to order the production of such pertinent documents or the appearance of such witnesses to give testimony under oath, as it may deem necessary to carry out the provisions of this resolution. Any order issued by such a board under the authority of this section may, upon application of such board or upon petition of the person or persons to whom such order is directed, be enforced or reviewed, as the case may be, in the same manner, so far as applicable, as is provided in the case of an order of the federal trade commission under the federal trade commission act.

An improvement for industry over the original Wagner bill is that only persons who violate the act "knowingly" are subject to a fine of $1000 or imprisonment for one year, or both. The boards expire June 16, 1935, when NIRA terminates.

Senator LaFollette succeeded in forcing in this amendment:
"Nothing in this resolution shall prevent or impede or diminish in any way the right of employes to strike or engage in other concerted activities."

New Capacity

CARNEGIE STEEL CO., Pittsburgh, has plans for a continuous strip mill at one of its plants near Youngstown, O., requiring only sanction of the finance committee of the United States Steel Corp., New York, before proceeding. If early approval is obtained, the mill would be in operation early in 1935. This would be the first continuous strip mill operated by any Corporation subsidiary.

¶Mesta Machine Co., Pittsburgh, has awarded electrical equipment for the continuous 76-inch strip mill it will build for the Youngstown Sheet & Tube Co., at Youngstown, O. This equipment was placed with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and General Electric Co., Schenectady, N. Y. The Westinghouse portion amounts to nearly $1,000,000, and includes six 3500-horsepower motors. The Youngstown mill is to be completed by April 1

NRA

JOHN J. CONNOLLY, of division 4 of NRA, is now handling the scrap iron and other waste materials codes. Mr. Connolly has been special assistant to A. D. Whiteside, formerly NRA division administrator.

¶Hearing has been scheduled July 2 on application of southern manufacturers of farm equipment for reduction in the minimum hourly wage rate from 30 cents to 25.

¶Code for the kiln, cooler and dryer manufacturing industry, supplemental to MAPI, was approved last week, effective June 23.

¶NRA is permitting the code authority for the fabricating metal products manufacturing and metal finishing and metal coating industries to handle all trade practice complaints.

¶Among birthday tributes to NRA on June 16, its first anniversary under Geneal Johnson, was this from directors of the American Iron and Steel institute, signed by Eugene G. Grace, vice president:

"Please accept our heartiest congratulations on the completion of the first year's work of the national recovery administration. Your constructive co-operation in connection with the administration of the iron and steel code has contributed greatly to its success. May your successful administration continue during the life of the act."

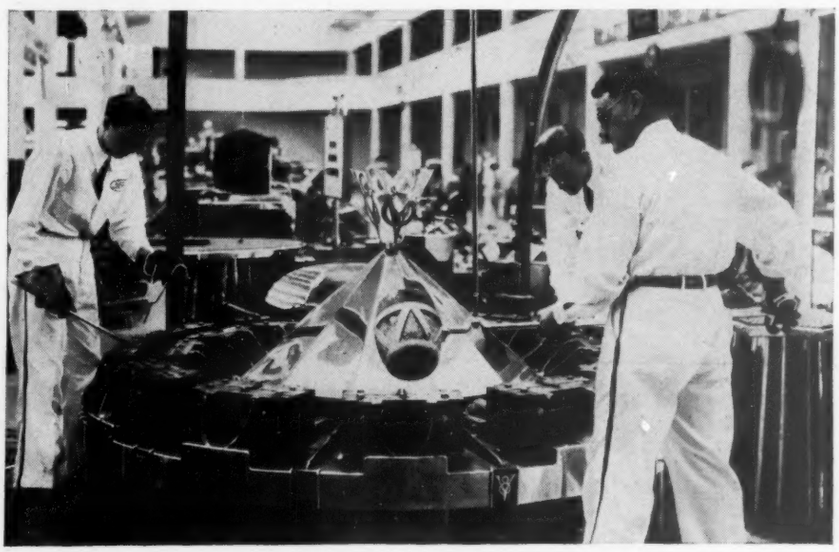
¶Robert L. Houston, formerly with the National Cash Register Co. and International Business Machines Co. and recently NRA deputy administrator, has been named division administrator succeeding H. O. King, now with the copper code authority.

PWA

OVER $250,000,000 worth of materials for use on public works projects was ordered between Oct. 1 and April 30, according to PWA Administrator Ickes.

Total value of iron and steel orders placed is estimated at $125,000,000, of which $60,000,000 is accounted for by orders for railroad equipment. Principal products include:

Product	Total value
Aircraft (new)	$ 1,293,801
Airplane parts	2,613,933
Aluminum manufactures	28,663
Ammunition and related products	12,453
Boat building, steel and wooden (small)	185,500
Bolts, nuts, washers, etc.	941,783
Cast iron pipe and fittings	2,307,536
Cement	5,463,002
Chemicals	121,604
Compressed and liquefied gases	62,107
Concrete products	3,040,767
Copper products	97,747
Doors, shutters, window sash and frames, molding and trim (metal)	1,057,954
Electrical machinery, apparatus and supplies	10,794,939
Engines, turbines, tractors, water wheels and windmills	1,891,396
Explosives	561,214
Firearms	306,637
Forgings, iron and steel	2,135,680
Foundry and machine shop products, not elsewhere classified	13,419,725
Fuel oil	564,041
Furniture, including store and office fixtures	29,246
Hardware, miscellaneous	975,540
Instruments, professional and scientific	893,664
Lighting equipment	635,330
Locomotives, other than electric	3,518,995
Lubricating oils and greases	188,077
Machine tools	1,652,781
Motor vehicles, passenger	118,416
Motor vehicles, trucks	240,055
Nails and spikes	328,294
Nonferrous metal alloys, nonferrous metal products, except aluminum not elsewhere classified	587,122
Planing mill products	1,112,477
Plumbing supplies	1,539,332
Pumps and pumping equipment	1,355,996
Rail fastenings, excluding spikes	3,504,575
Rails, steel	14,689,987
Railway cars, freight	31,709,581
Railway cars, mail and express	219,157
Railway cars, passenger	4,879,973
Refrigerators and refrigerator cabinets, including mechanical refrigerators	195,225
Sand and gravel	1,575,170
Sheet metal work	1,021,375
Smelting and refining lead	61,482
Springs, steel	360,976
Steam and hot water heating apparatus	1,505,687
Steam and other packing, pipe and boiler covering, and gaskets	71,876



WHAT THE WELL-DRESSED FOUNDRYMAN IS WEARING: The vogue for white this summer is catching up with ideas of cleanliness which Henry Ford has long entertained. These employes of his are casting push rods—a typical die-casting operation—at the Ford exhibit at the Century of Progress at Chicago

Steel works and rolling mill products, other than steel rails, including structural and ornamental metal work	39,615,729
Switches, railway	656,254
Tools, other than machine tools	472,130
Wire, drawn from purchased rods	1,820,682
Wirework, not elsewhere classified	165,368
Wrought pipe, welded and heavy riveted	19,207

Foreign

BRITISH machine tool makers are in a prosperous state with near-term prospects bright and some firms having an ample backlog of orders, according to Consul George A. Makinson, Birmingham, England, in a report to the bureau of foreign and domestic commerce.

Naturally, British makers are getting the bulk of the business resulting from the general industrial revival in Great Britain, but American machine tools are again coming into their own, partly due to elimination of the exchange handicap.

While British machine tool makers have been doing a steadily expanding trade in their home market they have been consistently losing ground in foreign markets. One reason is completion of the Soviet 5-year plan and another the resumption of diplomatic relations between America and Russia.

¶Russian pig iron production set a new record on April 25 when it reached 29,393 tons, or 1.4 per cent more than the planned output. On the same day, steel ingot production was 27,834 tons, and finished rolled steel 19,990 tons. (In April, daily average output of pig iron in the United States was 57,873 tons, and of steel ingots 117,425 tons).

Financial

FOLLANSBEE BROS. CO., Pittsburgh, and Wickwire Spencer Steel Co., New York, are the first steel companies to file for reorganization under the revised federal bankruptcy act.

John Follansbee and George Ladd, receivers of the Follansbee company since May 11 (STEEL, May 14), are expected to be named trustees in compliance with the new act.

Edward C. Bowers and Charles L. Feldman, receivers for the Wickwire Spencer company since 1927, also are expected to be named trustees during the reorganization. Bondholders of the company began action at Buffalo last week under the new act.

¶New securities of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., resulting from the readjustment plan, are now ready for delivery, according to George R. Hanks, president.

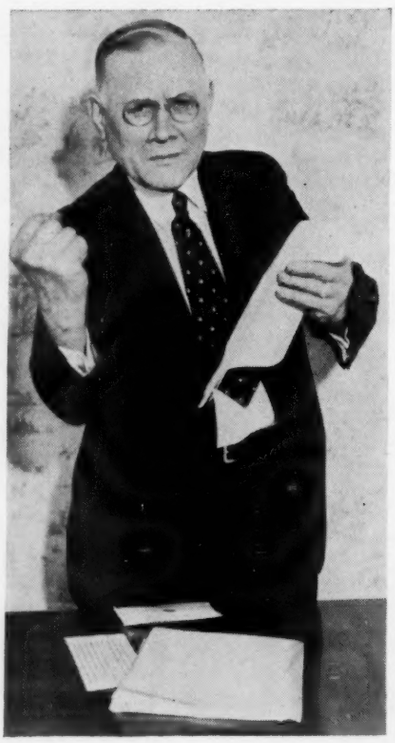
¶Struthers Iron & Steel Co., Struthers, O., reports net loss of $62.029 in 1933, compared with a loss of $68,217 in 1932.

¶Rustless Iron & Steel Corp., including Rustless Iron Corp. of America, Baltimore, reports net income, after charges, for the first five months of 1934 as $48,590.

¶The 1933 annual report of the Terminals Building Co., Cleveland, controlled by O. P. and M. J. Van Sweringen, railroad magnates, discloses that last year the company sold 90,500 shares of Otis Steel Co. common stock, reducing its holdings to 123,167 shares.

¶Arthur Roeder, president and receiver for the Colorado Fuel & Iron Co., Denver and Pueblo, Colo., has been instructed by the federal court at Denver to pay the August, 1933, bond interest.

¶Ludlum Steel Co., Watervliet, N. Y., has declared the full quarterly dividend on its 6½ per cent preferred stock, payable July 2 to stockholders of record June 22.



ORGANIZED LABOR'S MAILED FIST: This time it is aimed at radicals in labor's own bosom, for William Green, president of the American Federation of Labor, is shown speaking before the Amalgamated convention in Pittsburgh, June 15, and demanding that the steel strike be postponed, which it was. There is at Doorn, Holland, a gentleman who used to shake a similar fist in the face of Europe.
Wide World photo

Labor

WISCONSIN state industrial commission, Madison, orders compulsory unemployment insurance to become effective July 1. Contributions by employers to individual or state reserve funds begin on that date, initial levies being 2 per cent of payrolls until the reserve fund amounts to $55 per employe, after which it is halved. Benefits to qualified employes ranging from $5 to $10 weekly for a maximum of ten weeks will be payable beginning July 1, 1935.

¶South Chicago, Ill., plant of the Youngstown Sheet & Tube Co. on May 31 completed 457 consecutive days and about 1,091,860 man hours without a lost day on account of accident.

¶Unemployed industrial labor in April totaled 7,907,000, compared with 8,021,000 in March, and the peak of 13,203,000 in March, 1933, according to the National Industrial Conference board. The decline in unemployment in the manufacturing and mechanical groups from March, 1933, to April, 1934, was from 6,423,000 to 2,500,000. American Federation of Labor estimate of unemployment in April is 10,616,000, against 10,877,000 in March.

Production

STEEL production sagged 3 points to 59 per cent last week, and indications are that the rate will decline still further this week due to several large producers taking off open hearths. Chicago and Youngstown dropped 7 and 4 points, respectively. Buffalo was down 11 points to 47 per cent, Cleveland off 1 to 76, while other districts remained unchanged. Details for various districts follow:

Youngstown—Decreased 4 points last week to 62 per cent, and the valley mills are expected to start this week at 55 per cent, off 7 points. However, fabricators are more active and Truscon Steel Co. output is at 60 per cent.

Empire Sheet & Tin Plate Co., Mansfield, O., has resumed in its open-hearth and sheet-bar mill.

Cleveland-Lorain—Down 1 point to 76 per cent last week. National Tube Co., Lorain, and Corrigan, McKinney Co., each held 12 open hearths in operation, while Otis Steel Co., dropped from six to five units in mid-week. Schedules for this week are unchanged.

New England—Held at 70 per cent last week, with no change indicated for this week.

Central eastern seaboard—Fractionally lower at 46 per cent last week, with a substantial drop expected in

(*Please turn to Page 72*)

WINDOWS OF WASHINGTON

WASHINGTON

WITH a large-scale touching up of the New Deal, congress has adjourned and gone home. Unless the President should call an extra session—and this is most unlikely—the capitol dome will not again be illuminated until the next congress goes into session in January.

In the meantime, all the members of the house and one-third of the members of the senate come up for re-election this fall.

Anybody who thinks that the Wagner bill substitute, enacted during the closing days and signed by the President, is the final legislation in the matter of industrial relations, should send to the public printer at Washington for a copy of No. 135, Volume 78, of the *Congressional Record* for Saturday, June 16.

Herein is recorded the final debate on the subject of labor legislation. The record clearly shows that the opposition of the steel industry and other groups was all that prevented the enactment of the original Wagner bill.

"We will fight for it next year," Senator Wagner said, "when the country will have become sufficiently educated as to the need for it."

Violators Will Be Punished

The new law is in effect for only one year. It will expire on June 16, 1935. It is clear, therefore, that industry will do well to observe carefully the legislative trend during the first half of next year.

Just how the new law will be applied to the steel labor situation is not yet definite. But the labor boards to be set up by the President under this law have the power to order elections and to require the production of all pertinent documents and question witnesses. It may prescribe rules and regulations, violation of which may be punished by a fine of $1000 or by imprisonment for one year, or both.

Naturally, this feature of the new law is causing some interest in the climate and the living conditions under governmental auspices at Atlanta and Leavenworth.

Designation of Miss Perkins as President Roosevelt's representative for the settlement of the threatened steel strike is of particular interest in view of the recent declaration of the steel labor leaders that they were "through with her." But they seem to have changed their minds and last week emerged from conferences with Miss Perkins in a much less tense mood than they wore during their previous visit to Washington.

Chickens Come Home To Roost

General Johnson is regarded as definitely in the discard as a mediator or conciliator in labor disputes. The general now is having labor troubles of his own. Recently a group of NRA employes in Washington organized NRA lodge of the American Federation of Government Employes. The general discharged a member of the lodge and wound up by dismissing its president on ground of inefficiency. The general has been very busy handling the ensuing tempest.

Plans for the expenditure of the vast amount of money which congress placed at the disposal of the President already are in process of determination. PWA funds have been increased by $500,000,000 and this is in the stage of being allocated. The navy is to get, from PWA, $40,700,000, to cover the construction of the 24 new vessels recently announced, and a large number of new airplanes, and a $2,700,000 expansion of the naval aircraft factory at Philadelphia.

FERA, TVA and NRA also have a total of $399,325,000 in new money. The next few weeks will witness the allocation of all these funds. In all cases the money is to be spent as soon as possible so as to stimulate re-employment and the purchase of material and equipment.

The position of the supplier of materials and equipment under this plan is ideal. The borrower under this plan does not handle any of the money himself; the money is turned over by the lending institution directly to the contractor or supplier.

The principal concern of contractors and manufacturers who expect to derive business under this plan, is to qualify with the agency, shortly to be designated, on the basis of quality, price and responsibility. Of equal importance, of course, is the necessity of perfecting distribution facilities.

Much interest has been aroused here by the circularization of the Pacific coast trade by an importer of steel. The importer directed attention to that portion of the President's executive order No. 6646, dated March 14, 1934, which provided that "this paragraph shall not be construed as requiring the restriction of the use of material to those produced within the United Sates nor to require price differentials in favor of such materials."

It was held by the importer that by reason of this clause, the way was clear for the purchase of foreign materials for all buildings, federal or nonfederal.

Different View in Capitol

However, the President's order specifically stated that no bid on a government-owned or government-controlled project might be considered unless the contractor, manufacturer or supplier accompanied his bid with a certificate of code compliance.

In Washington, this is considered as positively eliminating foreign materials from government work—with the exception of materials which are scarce in the United States, or which are not available here in the desired quality—and these are points on which the government purchasing officers have the power of decision.

Because government construction is regarded primarily as creating business and employment, very few

exceptions to this policy are permitted.

And as to nonfederal projects financed by government money, the same restriction prevails. A standard provision in all PWA contracts, covering both federal and nonfederal work, reads:

"So far as articles, materials and supplies produced in the United States are concerned, only articles, materials and supplies produced under codes of fair competition adopted pursuant to the provisions of title 1 of the act, or under the President's re-employment agreement, shall be used in work on the project, except when the government determines that this requirement is not in the public interest or that the consequent cost is unreasonable."

This policy of buying only domestic materials for buildings financed by the government had its inception in the treasury-postoffice act of March 3, 1933.

On May 29, 1934, General Johnson issued an order of exception to the act of March 3, 1933, which was worded somewhat confusingly and which caused some conjecture as to whether the order was intended to void the restriction against foreign materials. Inquiry at NRA reveals that this order has not changed the situation in any respect.

Anybody who assumed, therefore, that imported materials may be used in constructing federal or nonfederal buildings financed by government money, seems to be laboring under a misapprehension.

Half Billion Tagged for Loans

Regulations now are being prepared to cover conditions under which loans to industries may be made under the new law signed by President Roosevelt. By this act, RFC will be able to make industrial loans in total amount of $300,000,000 and the Federal reserve board in the total amount of about $280,000,00. Advances are to be made only when it is found impossible to obtain requisite financial assistance on a reasonable basis from the usual banking sources. By this act the administration hopes to encourage loans by banks on a larger scale.

A rumor which has gone the rounds of Washington is that postoffices and other buildings hereafter are not to be allowed to exceed 20 cents a cubic foot in cost. This is entirely unfounded. However, PWA has reached the conclusion that no monumental buildings will be erected in communities in which they are not justified. A recent case is cited where Fairbanks, Alaska, with population of 3000, was provided with a new postoffice at a cost of $435,000. On the other hand, buildings of monumental type will continue to be built in large centers where they are justified. This conclusion, of course, has a bearing on business in marble, granite, stainless steel, ornamental metalwork, trim, fixtures, etc.

The Summers bill, as amended and signed by the President, designates the controller-general of the United States to receive and adjudicate claims for increased compensation in connection with government contracts placed prior to Aug. 10, 1934. The controller-general, as the facts warrant, has the power to allow contractors increased compensation to the extent of 7 per cent of the original contract price. Thus, contractors are given the opportunity to get reimbursement resulting from increased costs arising out of the activities of NRA.

Dredging Operations Spurred

Of much interest to diversified manufacturers is the outlook for dredging operations on a vast scale all over the country for an indefinite period ahead, provided the army engineer corps gets the money necessary for this work—and it is believed it will get a liberal appropriation. The recent letting of 20 dredge pumps and a large amount of pipe line tonnage for operation at Fort Peck is an illustration of what may be expected in the future.

Bids were opened by the United States engineer office at Vicksburg, Miss., June 12 on 44 steel dredge pontoons and a large quantity of 30-inch diameter welded steel pipe. The pontoons are to be of welded steel construction, each 48 feet long, 18 feet wide and 2 feet 10 inches deep. They are to be made of 3/16-inch plate. The pipe will involve 65 sections, each 52 feet long, to be made of ½-inch open-hearth steel plate containing 0.35 to 0.45 per cent carbon. The pipe also will be accompanied by cast iron flanges and forged steel drop bolts.

The engineer's office at Memphis recently placed contracts for the construction of a large number of pontoons and a large quantity of 27, 30 and 32-inch steel pipe. Plans call for a large amount of additional purchasing of this character in the near future.

As to dredges, the army engineer corps also is actively placing business and is expected to continue to do so. For instance, it recently awarded to Marietta Construction Co., Point Pleasant, W. Va., contracts for two new dredges and a 1600-horsepower twin-diesel powered tugboat. A new dredge for the Louisville district now is being planned and will be advertised in the near future.

In the construction of these vessels a greater use of welding is being allowed. Many design influences are active in connection with new dredges, including such matters as cast versus flame-cut steel gears, the selection of antifriction bearings, whether or not to hard surface the linings of new pumps so as to secure greater abrasion-resistance and longer life, selection of clutches, etc.

Repairing of dredges also will continue to be an active scale. The dredges HARRIS and PULLEN are to be equipped with larger twin diesels. The dredge WALATKA is to be equipped with a turbogenerator set for increased power to the cutter motor and hoisting and swinging line. The dredge HENRY BACON is to be equipped with new forged steel shafting and other parts. It also will be equipped with a new and heavier ladder. These cases are mentioned as illustrative of a large amount of similar business which will come out in the near future.

It is of interest that the low bid on the cleaning of the Washington monument was $30,000, whereas the figure on the erection of the pipe scaffold required in performing this task was $50,000. These figures were bid by the Archer Iron Works, Chicago. Incidentally, this company's bid was accepted despite the fact it came in after the closing date, for the reason that the delay was due to grounding of a mail plane near Pittsburgh.

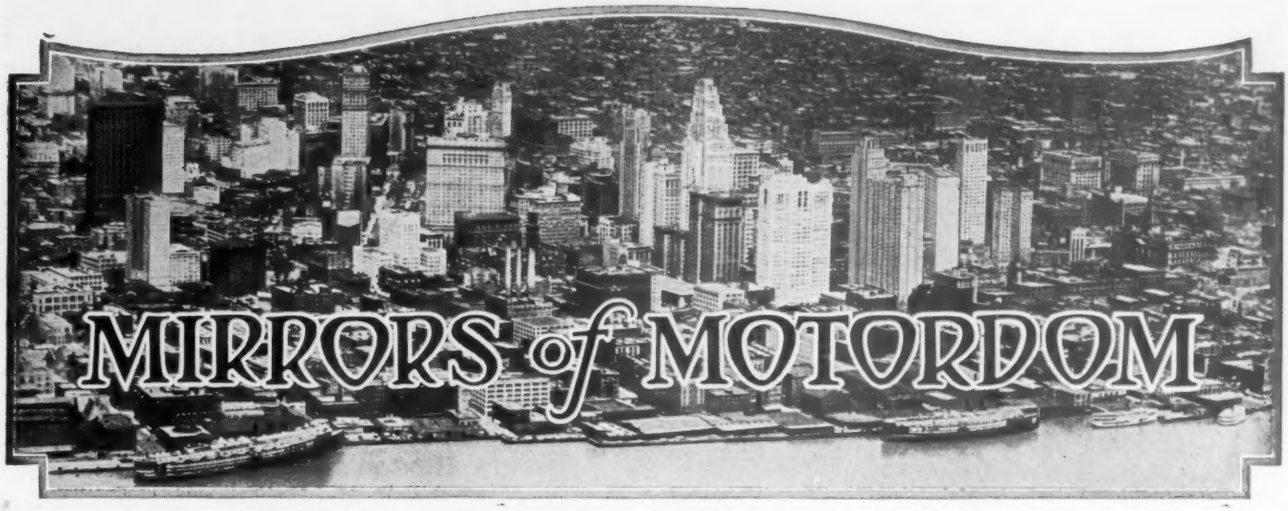
Take More Bids on Dam Needs

Large steel and fabricated steel and metal requirements will be needed for the construction of the Parker dam project in California and Arizona. Bids on the labor contract will be opened by the bureau of reclamation in Los Angeles July 26. The materials will be bought as required over the period of the next two to three years.

These include 1,874,000 pounds of concrete reinforcing steel bars, 425 linear feet of corrugated metal pipe, 313,500 pounds of metal pipe and fittings, 4,100,000 pounds of spillway gates and hoists, 826,500 pounds of trash-rack and miscellaneous metal work, 12,000 linear feet of electrical wire conduit.

Bids will be opened by the bureau of reclamation at Fairfield, Mont., July 12 on the labor contract for the Mill Coulee canal in Montana. Later materials and equipment contracts will be let. This job will take 96,000 pounds of concrete reinforcing bars, 504 linear feet of 20 to 30-inch corrugated metal pipe and 14,800 pounds of gates and miscellaneous metal work.

Bids will be opened July 2 by the bureau of reclamation at Spokane on the water supply and sewer systems for the government camp at Grand Coulee dam, in the state of Washington. This will require 14,000 pounds of concrete bars and mesh, 20,410 linear feet of 3 to 8-inch cast iron water pipe, with fittings, valves and specials, 130 feet of 8-inch slip-joint metal pipe, 20 fire hydrants, 200 corporation cooks, 18,000 linear feet of ¾ and 1-inch copper service pipe, etc.



DETROIT

THE manner in which automobile production holds at about 70,000 units weekly is surprising even manufacturers, and since the incentive to build up stocks of finished cars has lessened as the labor tension has decreased the retail sales position continues exceedingly strong.

Last week assemblies of passenger cars and trucks totaled 70,330 units, according to *Cram's Reports*, compared with 71,293 in the week ended June 16, and 69,107 in the week ended June 9. Estimates of June production thus must be revised upward at close to 300,000 units, compared with 253,387 in June, 1933.

Chevrolet, still unchanged at 18,800 units weekly, will about make good its June schedule of 88,000. Its tentative schedule of 73,000 units for July has been increased to 92,000, owing to an encouraging rise in retail sales, and some departments have returned to a 5-day week. The tentative schedule for August is 60,000 units.

Ford also was unchanged last week, at 21,485 units, and notes a resurgence of retail demand following from the wide publicity on the recent price reduction. Ford's June total will exceed 90,000, and for July the tentative schedule is 75,000.

Plymouth eased off a little last week, producing 8325 units, compared with 9750 in the week ended June 16, and 8000 in the week ended June 9. Last Monday it set a new high record with 1898 units assembled. Judging from parts releases, covering 1800 models daily for the remainder of June and for July, the July schedule appears to be about 43,000 units.

Studebaker, planning to announce its new lines this week—probably Tuesday—has increased production sharply to 2150, compared with 1200 the week before and 550 the second week previous. The Dictator group will have a 114-inch wheelbase, a 6-cylinder motor, and will start at $695. The Commander series starting at $890 and the President series starting at $1170 will have 8-cylinder motors. The three groups will present 17 different body types. Studebaker has doubled its original schedule of 2000 cars for July.

Terraplane-Hudson output last week at 2188 units was a gain of practically 200 over the week preceding. Its July schedule will be close to 8000 units. In five months of 1934 Terraplane-Hudson production totaled 60,745 cars, an increase of 267 per cent over the 16,557 cars turned out in the corresponding period of last year.

Other production statistics for the week ended June 23, with the change from the week ended June 16, are: Chrysler 800, up 100; Dodge 3250, off 250; Graham 320, up 130; Hupp 270, up 70; Nash 1500, down 250; Reo 500, off 100; Willys-Overland 500, off 250. These makers were unchanged: Olds 3000, Pontiac 1250, DeSoto 400, Buick 2500, Auburn 175, Cadillac-LaSalle 375.

THE race between the big three in the low-price field is getting hotter from a personal standpoint.

Chevrolet, now advertising that its motor is "so good it never needs to be replaced," is aiming directly at the Ford offer to replace its V-8 motors with rebuilt units at approximately $50.

Early in July, Chevrolet's advertising will take a new tack, hitting home at leaf springs as "akin to the old buggy" and unlimbering some heavy guns against any other motor than the six. Chevrolet dealers are well stocked with new literature.

Plymouth is in the fight with the soothing argument that now that all three are priced the same, its superior mechanical features should swing buyers. Chevrolet's shafts at motors other than sixes, of course, leave Plymouth unscathed.

Ford, meanwhile, is concentrating its selling argument on the contention that it did not raise prices in 1934, and hence its recent reductions constitute a new low for this year. This is true, technically, but last December when the present Ford series was announced retail prices were hiked $5 to $35 from previous levels.

ONE day less than two weeks ago a number of top executives in the automobile industry descended upon Washington. Their pockets and minds were crammed with plans of the motor industry for next year. How much money they would spend, how many men they would employ in preparation for 1935 models, how far their plans and purchases would penetrate all industry!

But, the story goes, this alluring assistance to recovery and "the new deal" was contingent upon certain assurances — assurances that the modified Wagner bill would be sidetracked at the session of congress just ended and that the soft pedal would be put on militant labor wherever possible. This was not exactly put up to Washington as an ultimatum, but automobile execu-

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1932	1933	1934
January	119,344	130,087	161,086
February	117,418	106,888	235,384
March	118,959	118,002	336,013
April	148,326	180,713	360,620
May	184,295	218,347	.....
June	183,106	253,387	.....

Estimated by *Cram's Reports*

May	345,000
Week ended	
May 26	76,281
June 2	54,185
June 9	69,107
June 16	71,293
June 23	70,330

tives felt they could not risk such a program on uncertainties.

It may be coincidence or effect that congress has adjourned without passing the Wagner labor bill and that the Roosevelt administration, so far as the President and General Johnson are concerned, has shown unexpected sympathy for the steel industry in its labor trouble, and that rarely is there even the slightest suggestion of any difficulty in the automobile labor situation.

SO DETROIT learns that by the time July 1 rolls around the decision will have at last been reached to shoot in a big way on next year's changes.

Tool and die programs are now first to start, and shops catering to this type of work enter a feast after five months of famine. Machine tool design men in several automobile plants have been requested to take early vacations, all to be back by Aug. 1.

General Motors started the ball rolling last week by calling in parts makers on the Chevrolet program and stating that 1935 fender, panel, chassis and many miscellaneous parts contracts now are open for bids. Fisher Body is launching its next year's plans. Other General Motors subsidiaries soon will have plans in shape for bidding on parts.

But what will next year's cars look like? In summary, and without attempting to set down the intricate detail of each automobile manufacturer's plans, the industry's trends for next year will follow policies something like these:

Streamlining, regardless of whether you consider it in the same class as your poor relations, is here to stay. Those cars not streamlined this year will cross the divide in 1935, if by nothing more than more pronounced beaver-tailing in the rear and more extreme fender-skirting.

As an example of the hold streamlining will take, General Motors will adapt for most, if not all, of its cars the appearance of the 1934 LaSalle and Cadillac.

Coiled front springs, "knee-action" wheels, or call them what you will, are to be continued, but only on those cars that have them on present models. No new converts are likely to be won, the trend being strong among leaf-spring backers to enlarge their scope by backing the new idea of leaf springs plus the "cross-arm" feature.

Ford, outstanding leaf-spring backer, probably will sit tight. Though General Motors, Chrysler and others have toyed with the idea of coiled springing for rear wheels too, there is no engineering reason to believe rear wheels will be so equipped, at least on large-selling cars.

Rear engine mounting is still some way from actuality. There is no evidence today that any large-scale maker will use this idea next year and no 1935 retooling plans have made room for such changeovers.

Probably the closest that any manufacturer came to using rear-engine mounting in recent years—and this was three years ago—was Studebaker when it had the idea seriously for the Rockne, then being built at Detroit.

Body panel work will be simplified next year through the use of larger dies. Press shops have played with the thought of getting the steel industry to make them a wide enough sheet to stamp a complete body out of two pieces of sheet steel, but while this has been discarded, new dies indicate that tops, plus margins on all four sides, may be stamped from one sheet providing the "rumble" problem can be eliminated.

Many other stampings, dictated by streamlining, will be made in one operation next year instead of the several parts now welded. An example of the latter is the present beaver-tail and sloping back, built up from several stampings.

REPORTS of a large machine tool and plant equipment purchase by Packard appear unfounded in view of the desire to salvage equipment at the aircraft division for coming models. . . . Hupp by late this month will have released material and parts for 1500 of its junior models. . . . Labor-conscious from the strikes here, Chrysler Corp. recently let contracts for a large recreation park and playground solely for its employes, to be built near its Jefferson avenue plants. . . . Lincoln is reported to have over 500 finished cars stocked and unsold at Highland Park, this accounting for the cut in assemblies.

Here and There In Industry

INTERNATIONAL HARVESTER CO., Michigan avenue, Chicago, has installed a Lectromelt furnace at its plant at Cicero, Ill., for production of special high strength gray iron and steel products. Its capacity is 1000 pounds per heat.

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Coastal Supply Co., Houston, Tex., has been formed by F. M. Hoskins, president, to distribute oil field and heavy hardware supplies.

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National Wire & Supply Co., Chicago, recently moved to new and larger quarters at 2445 North Keeler avenue. The company now has 30,000 square feet of floor space devoted to the distribution of bars, wire, nails and other steel products, serving also as representative in the Chicago district for several mills. L. B. Kidwell and H. A. Furlong are officers of the company.

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Louis Allis Co., Milwaukee, manufacturers of electric motors, has opened a direct factory branch office in the Bona Allen building at Atlanta, Ga., in charge of George C. Gardner.

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Ferro Enamel Corp., Cleveland, is building a junior continuous porcelain enamel furnace for the Florence Stove Co., Kankakee, Ill., manufacturer of stoves and similar products. This is a new type of furnace, employing the continuous feature.

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Ingalls Iron Works Co., Birmingham, Ala., has completed fabrication of an all-welded steel dredge at its Chickasaw works, requiring 750 tons of steel. The dredge is of the bucket type and will be used on the bayous, bays and rivers of southern Alabama.

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Continental Motors Corp. is moving its sales and service offices and part of its engineering department from Detroit to Muskegon, Mich. Consolidation of these offices in Muskegon indicates eventual removal of all executive offices and practically all production to Muskegon, where Continental was established 30 years ago.

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Wisconsin Motor Co., 1910 South Fifty-third street, Milwaukee, manufacturer of gasoline motors, will start within the next 60 days the manufacture of diesel engines for railroad, industrial and marine uses. M. J. Murphy, formerly chief engineer for the Caterpillar Tractor Co., Peoria, Ill., will be in charge of diesel production.

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Thomas Prosser & Son, New York, manufacturers of Widia cemented carbide cutting tools, have had an increase of 321 per cent in orders billed for these tools and tips in the first five months of 1934, compared with the same period of 1933. The increase comes from greater activity in machine shops generally and also from wider adoption of these tools.

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Ajax Electrothermic Corp., Trenton, N. J., has sold a 300-kilowatt melting furnace equipment to the United States navy yard at Washington for production of alloy steel castings. Four furnaces are available for alternate operations, two of 2200 pounds, one of 250 pounds and one of 100 pounds capacity. This installation brings the total power used by Ajax-Northrup equipment in this country to over 14,000 kilowatts and the world total to over 43,000 kilowatts, an increase of 19,000 kilowatts since January, 1931.

Industrial Men in the Day's News

Paul N. Anderson, President, Dahlstrom Metallic Door Co.

With the exception of college education in Massachusetts, his career has centered in Jamestown, N. Y.

For seven years he was vice president and treasurer of a company manufacturing bedroom furniture.

Despite the press of business, he finds time to take active interest in civic affairs of his home town.

PAUL N. ANDERSON, recently elected president of the Dahlstrom Metallic Door Co., Jamestown, N. Y., was born in Jamestown and graduated from Phillips' academy, Andover, Mass., in 1917. He then attended Massachusetts Institute of Technology, Cambridge, Mass., graduating in 1921.

Following his educational training, he became associated with the Empire Case Goods Co. of Jamestown, manufacturer of bedroom furniture. From 1925 to 1932 he was vice president and treasurer of this company, selling out his interest in the latter year.

He then became connected with the Dahlstrom company, and in March of this year was chosen president and general manager. This company manufactures, in addition to metal doors, a line of metal partitions and interior trim, metal moldings and shapes, elevator entrances and library stacks.

Mr. Anderson is a member of the board of public utilities which operates the municipal water and light departments of Jamestown; a member of the board of directors of the Bank of Jamestown; a director of Hotel Jamestown Inc.; and a director of the Jamestown chamber of commerce. He is the father of six boys, the eldest of whom is 12.

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William E. Umstattd has been elected president of the Timken Roller Bearing Co., Canton, O., succeeding H. H. Timken who has resigned, effective June 16. Mr. Umstattd has been with the company since leaving the army in 1919 and has worked in all departments, holding positions as assistant superintendent, assistant factory manager and in 1932 factory manager. At that time he was advanced to executive vice president. For the last 2½ years he has had intimate contact with all activities, including financial, selling, production and general company policies. Mr. Timken remains as chairman of the board.

Henry H. Timken Jr. has been elected a vice president of the Timken Roller Bearing Co. and a vice president of the Timken Steel & Tube Co.

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Stanley A. Knisely, director of advertising for the sheet steel trade extension committee of the National Association of Flat Rolled Steel Manufacturers from 1927 to 1933, has been appointed sales promotion manager for the Republic Steel Corp., with headquarters at Youngstown, O. At one time he was active in newspaper work, later serving as advertising manager and assistant secretary of the National Paving Brick Manufacturers association.

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D. A. Nemser has been appointed development engineer for the International Nickel Co. Inc., New York, with headquarters in Hartford, Conn. For ten years he was associated with the metallurgical staff of Pratt & Whitney Mfg. Co., Hartford, the last five years being chief metallurgist. In his new capacity he will work with manufacturers throughout the New England territory on problems involving the selection, heat treatment and utilization of nickel alloy steels, nickel cast irons and other alloys containing nickel. Mr. Nemser also has been associated with the Atlas Steel Corp., Dunkirk, N. Y.; the MacBeth-Evans Glass Co., Charleroi, Pa.; and the Henry Souther Engineering Co., Hartford. He is past president of the Hartford chapter of the American Society for Metals.

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E. H. Gaddis has been placed in charge of the branch office recently opened in Tulsa, Okla., by the Chapman Valve Co., Indian Orchard, Mass.

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D. T. Langan has been transferred to Tulsa, Okla., from Kansas City, Mo., as industrial sales representative for the Youngstown Steel Products Co., Youngstown, O.

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Charles J. Neyens has been appointed secretary and director of sales of the Eagle Grinding Wheel Co., Chicago. This company recently changed its name, formerly having been the Eagle Emery & Corundum Wheel Co. which was incorporated in 1892.

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B. K. Paget has been placed in charge of ventilator sales of the ventilation division of the Swartwout Co., Cleveland. At one time he was associated with John J. Nesbitt Inc. and the L. J. Wing Mfg. Co., New York, in heating and ventilating sales work, and goes to Cleveland from Scranton, Pa.

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L. E. Connelly, until 1931 president of the D. Connelly Boiler Co., Cleveland, has been appointed administration member of the code authority for the standard steel barrel and drum manufacturing industry, steel package manufacturing industry and washing machine parts manufacturing industry.

W. C. Connelly, for 35 years vice president of the Connelly company, retiring in 1933, has been named administration member of the code authority for the milk and ice cream can manufacturing industry and the galvanized ware manufacturing industry.

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M. G. Tennent, retiring mayor of Tacoma, Wash., will assume new duties with the Pacific Iron & Steel Co., Tacoma, acting as vice president. Before his term as mayor, he spent 12 years in building up the Tennent Steel Casting Co. He will be employed in a consulting capacity with the Pacific company, which originally was the Puget Sound Iron

& Steel Co. and for several years was known as the Pacific Lidgerwood Co. when the Lidgerwood Mfg. Co. took it over as a western branch for the manufacture of logging and other special heavy machinery.

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James A. Farrell, former president of the United States Steel Corp., New York, sailed June 20, with Mrs. Farrell, for a holiday in Ireland.

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H. D. Runciman is now associated with the Precision Grinding Wheel Co. Inc., Philadelphia, with headquarters in the company's Detroit office, 2832 East Grand boulevard.

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Fred Loftus, formerly identified with Surface Combustion Corp., Toledo, O., recently has joined the Union Mining Co., Oliver building, Pittsburgh, to handle sales of "Loftus" checker brickwork.

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David S. Gaston, for many years manager of the tin plate sales department of Follansbee Bros. Co., Pittsburgh, has become associated, effective July 1, with the tin plate sales department, Jones & Laughlin Steel Corp., Pittsburgh.

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V. A. Olsen has been appointed works manager of the Cadillac Motor Car Co., Detroit. He has been with the company for 16 years, beginning his career in the tool designing department, later becoming assistant superintendent of tools and equipment. Three years later he was made superintendent, and in May, 1932, assistant works manager.

C. A. Raftrey has been appointed assistant to Mr. Olsen.

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W. J. Maton, Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn., has been elected president of the Connecticut Foundrymen's association for 1934-35. Other officers named include: Vice president, B. W. Spencer, Bradley & Hubbard Mfg. Co., Meriden, Conn.; secretary, N. J. Stringer, the Charles Parker Co., Meriden; treasurer, C. R. Holmes, McLagon Foundry Co., New Haven.

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E. H. Hughes, manager of the Memphis, Tenn., warehouse of Jones & Laughlin Steel Corp., Pittsburgh, has been appointed assistant manager of the steel construction department at the company's main offices in Pittsburgh, effective July 1. Mr. Hughes has been with Jones & Laughlin since 1916, first being in the Chicago warehouse division. He has been manager of the Memphis warehouse since January, 1926.

E. W. Harwell succeeds Mr. Hughes in Memphis as district sales manager. E. E. Hoehle has been named assistant district sales manager at Memphis. Both Mr. Harwell and Mr. Hoehle are at present connected with the Memphis division of the company.

Died:

SIDNEY R. RECTANUS, 46, vice president in charge of operations of the American Rolling Mill Co., Middletown, O., in that city, June 22. Recently he had asked to be relieved of his duties with the company in whose employ he had been since 1909, to establish himself as a consultant on management problems (STEEL, May 21, p. 17). He started with the company as laborer in the galvanizing department, after graduation from Purdue university. Becoming superintendent, he later was placed in charge of the employment department in 1916. In 1923 he removed to Ashland, Ky., when the company began construction of its continuous sheet mill there, later being named assistant manager and works manager of the Ashland division. He was elected vice president in charge of operations Jan. 1, 1930. He was a director of the American Iron and Steel institute and the American Management association.

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J. C. Griffin, president and general manager of the Griffin Mfg. Co., Erie, Pa., producer of cold-rolled strip steel, in Erie, June 20.

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W. G. Bryson, 76, one of the founders of Black, Sivalls & Bryson Inc., Bartlesville, Okla., tank manufacturers, at a Bartlesville hospital, June 9.

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Myron Phillips, 63, management representative of the Central Alloy division of Republic Steel Corp., in Canton, O., June 19.

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R. E. Browning, 35, superintendent of the cold-rolling department, Universal Steel Co., Bridgeville, Pa., in an automobile accident near Bridgeville recently.

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John R. Neison, chairman of the board of directors and treasurer of the Ajax Metal Co., Philadelphia, in that city, June 16. He had been connected with the company in various capacities since 1882.

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Alexander Bruce, 65, president and general manager of the North Dakota Metal Culvert Co., Fargo, N. Dak., in that city, June 12. He was a member of the code authority for the metal culvert industry.

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George W. Fuller, nationally known consulting engineer, at his home in New York, June 15. His name has been identified with many large construction projects, and in February, 1933, he was elected chairman of the Engineering foundation, research organization of the senior national engineering societies.

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Robert Wetherell, 82, retired manufacturer of transportation and power plant equipment, at his home in Chester, Pa., June 18.

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William T. S. Johnson, 69, until six years ago vice president and treasurer of the Bradford Machine Tool Co., Cincinnati, in that city recently.

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Robert D. Campbell, 65, organizer of the Allegheny Steel Co., Brackenridge, Pa., and senior vice president and a director, in Orilla, Ont., June 20, while on vacation.

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John N. Champlin, district manager for New England, Wickwire Spencer Steel Co., at his home in Worcester, Mass., June 13. He had been in charge of sales for the company in New England since 1921.

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Fred Knadler, 67, who retired ten years ago as general adviser to the National Malleable & Steel Castings Co., Cleveland, in that city, June 19. He had been with the company for 43 years when he retired.

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William H. Watkins, 68, former vice president of the Empire Steel Co. and until four years ago superintendent of the Bourne-Fuller Co., in Cleveland, June 18. He started work in steel mills at the age of 11.

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W. E. Graham, 57, auditor at the Fairfield coke plant of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., in that city, June 19, from injuries received in an automobile accident.

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Frank G. Cutler, 53, for 28 years associated with the engineering department of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., in a New York hospital, June 17. In recent years he headed the company's steam engineering bureau.

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Thomas A. Dooley, 78, for 56 years associated with the American Car & Foundry Co., much of this time as manager of the company's St. Louis office, at his home in St. Louis recently. He will be succeeded by his son, Thomas A. Dooley Jr.

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Herman G Veeder Jr., 30, assistant manager of erection in the Leetsdale, Pa, district for the McClintic-Marshall Corp., in an airplane crash near Junin, Argentina. He was returning to the United States after several months as engineer in charge of McClintic-Marshall construction work for the Ultramar Petroleum Co., near Buenos Aires.

NRA Speakers Crack Down on Industry at Purchasers' Rally

BASIC principles of the NRA are sound, and industrial codes have gone a long way toward lifting the country from its depression—but before further advantages can accrue there must be considerable revamping in the present ideas of the recovery administration and in the codes.

This was the consensus of opinions expressed by speakers before the National Association of Purchasing Agents at their nineteenth annual international convention in Cleveland last week.

As to how far these modifications should go, various viewpoints were expressed. Some blamed labor organizations for taking advantage of the NRA and the codes; others charged certain industries have been the chief offenders.

For the four days in which the convention was in session the NRA was the chief topic of discussion, with emphasis on the government's price policies. The association draws its membership from many industrial groups; 1200 attended.

Industries Ask Regimentation

"Most of the regimentation of industries concerning which we have heard so many complaints has been done by the NRA at the request of industries themselves," said Leon Henderson, Washington, director, research and planning division, NRA.

"In one of our recent price discussions with the leaders of an important industry I asked the spokesman to give me a certificate that he had asked for certain clauses to be written into the industry's code. He refused. I asked him if we took some of the rules out of the code if it would be possible for the industry to handle its competitive situation. He said: 'No, it would be impossible, as there would be too many disagreements. The government must step in.' The next day the newspaper headlines were screaming this industry's protest against what we had 'forced' it to do."

Mr. Henderson declared that the government's price policy enunciated June 7 does not contemplate a sweeping determination of the justification of current prices, but provides for an emergency adjustment in the event "a downward spiral" appears to carry prices below costs.

He expressed fear that code provisions relating to prices may be overcome "by natural forces," pointing out that several industries have already asked the administration to relax its regulations on the grounds that they are preventing them from maintaining prices.

"I believe vicious monopolies can be broken by code provisions," he said. "The charge has been made that the NRA has increased prices faster than purchasing power. That is not true except in a few industries. Since the NRA was established real wages have been elevated at an angle of about 80 degrees; the average has risen far more than that of prices, despite all the government has done to raise prices."

Doubts as to the ability of the government through codes to maintain prices at the levels to which they have ascended crept into the remarks of other speakers.

"A few arrogant industries confident in the strength of their codes have reverted to the old philosophy of 'the pulbic be damned,'" said Stuart F. Heinritz, administration member on several code authorities, and formerly chief of the code section, consumers' advisory board, NRA.

"Unfortunately for their purpose, however, the public cannot be categorically damned, at least not in times like these. But the public can very quickly and effectively dam the flow of commerce. It can dam up the goods on the merchants' shelves, the stock in the manufacturer's warehouse, the ore at the mines.

"It does not do so from choice. Buyers and consumers have no desire to pose as a recalcitrant majority in a program where the welfare of every individual depends on universal co-operation. They want to buy to bring back industrial prosperity and in order to use and enjoy the products of industry. The national industrial recovery act was framed just as much to enable the buyer to buy as to enable the seller to sell. The two must go hand in hand—NRA must consider the buyer."

Positive action, he declared, is required in some means or device for maintaining a reasonable balance between the prices of goods and services and the customers' ability to pay. It is not inconceivable that they may involve the regulation of maximum prices instead of minimums. That is thoroughly consistent with the principle of minimum wages.

Sees Changes in Price Control

In discussing Mr. Heinritz's paper, Edward T. Gushee, NRA deputy administrator, pictured industry as "blindly driving the United States into the path already taken by Germany and Italy.

"Price fixing as now practiced under the NRA inevitably will result in government control of business, make business a mere department of government run by a bureaucracy not only for our social but economic system," he said.

"Many of the price control provisions of the codes will be drastically overhauled or eliminated," said Dexter M. Keezer, executive director, consumers' advisory board, NRA. "My faith in this regard is supported by the recent decision to make a critical re-survey of the basing point system set up under the steel code.

"There is frequently public occasion to protect sellers from peculiarly powerful and rapacious buyers. As I have worked with the consum-

New Officers

NATIONAL ASSOCIATION OF PURCHASING AGENTS

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District No. 2
WALTER R. HEYMAN
Oklahoma Gas & Electric Co., Oklahoma City, Okla.

District No. 3
GEORGE L. MEYER JR.
Stewart-Warner Corp., Chicago

District No. 4
RAYMOND E. FLYNN
Union Guardian Trust Co., Detroit

District No. 5
FRED J. LUCAS
Purdy-Mansell Ltd., Toronto, Ont

District No. 6
H. N. WILLIAMS
Scott & Fetzer Co., Cleveland

District No. 7
R. J. PREIS
Whitney National Bank, New Orleans

District No. 8
GEORGE S. FRANK
Cornell University, Ithaca, N. Y.

District No. 9
RALPH G. WAITE
Chemical Paper Mfg. Co., Holyoke, Mass.

ers' advisory board I have been increasingly persuaded that it would be a mistake, as a matter of public policy, to concentrate exclusively on the dangers of excessive price control by sellers. There are now concentrations of buying power which will bear watching."

American industry, according to Mr. Keezer, has attained a degree of corporate consolidation which renders futile any reliance upon free competition to safeguard public interest.

"With the 200 largest manufacturing corporations, constituting less than 1 per cent of the total of such corporations, controlling over half the country's manufacturing wealth, I think that proposition is obvious," he said.

Gen. Hugh S. Johnson wrote a letter to the association expressing the hope that "the greatest purchasing organization in the country may further economic recovery by buying consistently under the Blue Eagle."

Col. George S. Brady, NRA deputy administrator, declared that "company unions have usually merited the name given them by labor—yellow dog unions."

This was in a paper written for the convention, and in his absence read by Col. Walter Mangum, another deputy administrator.

"No honest man who desires to see fair play in industry and progressive planning should advocate the abandonment by labor of the position gained by it until there is assurance of substantial organization to free labor from domination of management," was part of Colonel Brady's message to the convention.

Several municipal purchasing agents were on the program and gave vent to their feelings at having to meet the higher prices charged for various commodities with reduced budgets. The sharpest criticism was expressed by Joseph W. Nicholson, purchasing agent for Milwaukee.

Cities, states and the national government itself "now are confronted with the worst collusive price fixing combinations in history, which have grown out of a misconstruction of the intent of the NRA," he declared. Codes, in his opinion, are being used as "alibis" for imposing extortionate prices.

"Unrestricted and uncontrolled price fixing leads to economic destruction and unless there is a surcease of these practices, or regimentation and control on the part of the government, the NRA will fail in its purpose," he said.

The extreme also was expressed by Roger W. Babson, business "seer" who wrote a letter to the convention predicting some form of dictatorship for the United States. This, he stated, is bound to come about through a conservativ eaction from the present complicated "economic mess in which the country will soon find itself."

On the other hand, Charles R. Stevenson, New York, who for several years has been directing affairs for several large trade associations, expressed the opinion that the country has not gone far enough with control of industry.

"We must face facts and either continue to conduct the industry of this country on the basis of unrestricted competition, which I believe will destroy the capitalistic system or the country itself, or else we must move forward to the system of controlled competition with a frank and definite recognition that controlled competition does mean price fixing, but price fixing properly controlled and checked in the public interest," he said.

Urges Return to Simple Functions

P. W. Litchfield, president, Goodyear Tire & Rubber Co., referred to the NRA principles as "admirable," saying that they have abolished child labor, stopped the paying of starvation wages and given employment to many more people "to perform the same amount of work."

"Unfortunately those classes of labor which were least affected by the depression organized to take advantage of the situation to improve their own positions before the surplus of labor had been absorbed, causing an increase in prices which served to offset the rising purchasing power."

He advocated that the NRA be brought back to its simple functions, for spreading work, maintaining minimum wages, protection of fair prices and practices, and then letting the natural laws of supply and demand take care of the balance of the problem.

Walter S. Tower, executive secre-

(Please turn to Page 75)

Rail Output in First Gain Since 1929; Biggest Increase in Heavy Sections

PRODUCTION of steel rails in the United States in 1933 was 416,296 gross tons, according to statistics of the American Iron and Steel institute. This is a gain of 13,730 tons over the 402,566 tons rolled in 1932, or 3.4 per cent increase.

Since 1867, when total rail production was 412,596 tons, no year has shown so small a total output. No year since 1877 has shown so small a production of steel rails, the tonnage rolled that year being 385,865 gross tons.

Institute figures show an interesting trend toward heavier sections. Rails between 100 and 120 pounds per yard decreased from 215,091 tons in 1932 to 154,007 tons in 1933 while those over 120 pounds per yard increased from 128,522 tons in 1932 to 157,787 tons in 1933. This is the first time the tonnage in the upper range has exceeded that in the lighter classification.

Only 300 tons of bessemer rails were rolled in 1933, compared with 397,792 tons of open-hearth rails. Rails rerolled from old steel rails totaled 18,204 gross tons.

Three mills engaged in the rerolling of old rails into new, of smaller section. Open-hearth rails were rolled by 14 mills and bessemer by one.

Production of Rails by Processes

Gross Tons

Years	Open-hearth	Bessemer	Electric	Rerolled*	Total
1914	1,525,851	323,897	178	95,169	1,945,095
1915	1,775,168	326,952	.....	102,083	2,204,203
1916	2,269,600	440,092	.....	144,826	2,854,518
1917	2,292,197	533,325	.....	118,639	2,944,161
1918	1,945,443	494,193	.....	101,256	2,540,892
1919	1,893,250	214,121	50	96,422	2,203,843
1920	2,334,222	142,899	297	126,698	2,604,116
1921	2,027,215	55,559	5	96,039	2,178,818
1922	2,033,000	22,317	.....	116,459	2,171,776
1923	2,738,779	25,877	118	139,742	2,904,516
1924	2,307,533	16,069	.....	109,730	2,433,332
1925	2,691,823	9,687	.....	83,747	2,785,257
1926	3,107,992	12,533	.....	97,124	3,217,649
1927	2,717,865	1,566	.....	87,055	2,806,486
1928	2,580,141	2,718	438	64,196	2,647,493
1929	2,662,163	3,486	723	55,766	2,722,138
1930	1,834,933	2,137	45	36,118	1,873,233
1931	1,135,551	813	15	21,372	1,157,751
1932	393,014	64	.....	9,488	402,566
1933	397,792	300	.....	18,204	416,296

*Rerolled from old steel rails.

1933 Pig Iron Production Up 52 Per Cent

PRODUCTION of pig iron in the United States in 1933 was 13,000,719 gross tons, compared with 8,549,664 gross tons in 1932, an increase of 52.06 per cent, according to statistics of the American Iron and Steel institute. Production of pig iron and ferroalloys combined in 1933 was 13,345,602 gross tons, compared with 8,781,453 tons, an increase of 51.97 per cent.

Ohio retained its position in first place in 1933, which it had assumed in the previous year, with an output of 3,918,723 tons, compared with 3,728,839 tons produced in Pennsylvania. Ohio accounted for 30.14 per cent of the total production and Pennsylvania for 28.68 per cent. The Indiana-Michigan group turned out 1,469,783 tons, 11.31 per cent of the total. Illinois was fourth in production with 1,012,676 tons, 7.79 per cent and Alabama was fifth with 900,170 tons, 6.92 per cent.

Dividing pig iron output into merchant and non-merchant it is found that 10,932,967 tons was for the maker's use and 2,067,752 tons was for sale. This is in line with the tendency of recent years for the proportion of merchant iron to become less as steelmakers integrate their plants further.

Of the total pig iron and ferroalloys produced, 9,561,076 tons was delivered in molten condition and only 102,208 tons was sand cast. The latter method of treatment is fast disappearing. Machine cast pigs totaled 3,496,263 tons, chill cast 175,359 tons, and 10,696 tons was direct castings.

The upward movement in 1933 seems to make 1932 definitely the bottom of the downward swing.

Production of pig iron and ferroalloys was gaining momentum during 1933, output during the first half being 44,389,977 tons, while in last half it was 8,610,742 tons. This indicates a substantially larger tonnage for 1934, since the output curve has continued upward this year.

PRODUCTION OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS, SHOWING INCREASE, 1932-1933, GROSS TONS

	1933	Per cent	1932	Per cent	Increase	Per cent
Pig iron:						
Basic	7,952,602	61.17	5,074,427	59.35	2,878,175	56.72
Bessemer and low-phosphorus	3,473,855	26.72	2,220,468	25.97	1,253,387	56.45
Foundry	1,055,622	8.12	811,484	9.49	244,138	30.09
Malleable	495,040	3.81	419,723	4.91	75,317	17.94
Forge	4,975	.04	1,558	.02	3,417	219.32
All other pig iron	18,625	.14	22,004	.26	*3,379	*15.36
Total pig iron	13,000,719	100.00	8,549,664	100.00	4,451,055	52.06
Ferro-alloys:						
Ferro-manganese, Spiegeleisen	162,764	47.19	93,644	40.40	69,120	73.81
Ferro-silicon	154,736	44.87	124,708	53.80	30,028	24.08
All other ferro-alloys	27,383	7.94	13,437	5.80	13,946	103.79
Total ferro-alloys	344,883	100.00	231,789	100.00	113,094	48.79
Grand total	13,345,602	.....	8,781,453	.....	4,564,149	51.97

*Decrease

PRODUCTION OF PIG IRON AND FERRO-ALLOYS BY STATES, SHOWING INCREASE, 1932-1933, GROSS TONS

States	1933	Per cent	1932	Per cent	Increase	Per cent
Pig iron:						
Pennsylvania	3,728,839	28.68	2,103,180	24.60	1,625,659	77.30
Ohio	3,918,723	30.14	2,387,028	27.92	1,531,695	64.17
Indiana, Michigan	1,469,783	11.31	1,034,801	12.10	434,982	42.04
Illinois	1,012,676	7.79	919,280	10.75	93,396	10.16
Alabama	900,170	6.92	652,898	7.64	247,272	37.87
New York	665,928	5.12	624,141	7.30	41,787	6.70
Maryland, West Virginia, Kentucky, Tennessee	1,143,600	8.80	680,774	7.96	462,826	67.99
Iowa, Colo., Utah	161,000	1.24	147,562	1.73	13,438	9.11
Total pig iron	13,000,719	100.00	8,549,664	100.00	4,451,055	52.06
Ferro-alloys:						
Pennsylvania	163,798	47.49	85,194	36.75	78,604	92.26
New York, New Jersey	98,857	28.66	85,875	37.05	12,982	15.12
Ohio, Ill., Ia., Colo.	63,386	18.38	41,510	17.91	21,876	52.70
Md., Va., W. Va., Ala., Tenn.	18,842	5.47	19,210	8.29	*368	*1.92
Total ferro-alloys	344,883	100.00	231,789	100.00	113,094	48.79
Grand total	13,345,602	.....	8,781,453	.....	4,564,149	51.97
Pig iron	13,000,719	97.42	8,549,664	97.36	4,451,055	52.06
Ferro-alloys	344,883	2.58	231,789	2.64	113,094	48.79

*Decrease

METHODS BY WHICH BESSEMER AND LOW-PHOSPHORUS PIG IRON WERE CAST OR DELIVERED IN 1933, GROSS TONS

States	Sand cast, machine cast, chill cast, etc.	Molten condition	Total
New York, Maryland, West Va., Alabama	130,239	202,718	332,957
Pennsylvania	98,733	1,022,810	1,121,543
Ohio	80,689	1,328,953	1,409,642
Indiana, Illinois	40,558	569,155	609,713
Total	350,219	3,123,636	3,473,855

PIG IRON AND FERRO-ALLOYS MADE FOR SALE OR FOR USE OF MAKERS IN 1933, GROSS TONS

Pig iron and ferro-alloys	For sale	For maker's use	Total
Pig iron:			
Basic	436,893	7,515,709	7,952,602
Bessemer and low-phosphorus	208,206	3,265,649	3,473,855
Foundry	1,019,770	35,852	1,055,622
Malleable	392,471	102,569	495,040
Forge or mill	4,871	104	4,975
White and mottled, direct castings, etc.	5,541	13,084	18,625
Total pig iron	2,067,752	10,932,967	13,000,719
Ferro-alloys:			
Ferro-manganese and spiegeleisen	88,451	74,313	162,764
Ferro-silicon	154,736	.....	154,736
All other ferro-alloys	27,383	.....	27,383
Total ferro-alloys	270,570	74,313	344,883
Total pig iron and ferro-alloys	2,338,322	11,007,280	13,345,602

PIG IRON MADE FOR SALE BY GRADES AND BY STATES IN 1933, GROSS TONS

States	Basic	Bess. & low-phos.	Foundry	Malleable	Forge	All other pig iron	Total
New York, Md.	75,613	50,123	158,604	44,335	.....	17	328,692
Pennsylvania	136,295	129,517	211,756	15,471	785	.....	493,824
West Va., Ala., Tenn	65,799	2,036	469,441	.....	4,066	.....	541,302
Ohio	156,658	9,997	106,568	230,208	.....	1,489	504,920
Ind., Illinois	1,138	16,533	26,664	102,457	.....	.....	146,792
Michigan, Iowa, Colorado, Utah	1,390	.....	46,737	.....	.....	4,035	52,162
Total pig iron	436,893	208,206	1,019,770	392,471	4,871	5,541	2,067,752

METHODS BY WHICH PIG IRON AND FERRO-ALLOYS WERE CAST OR DELIVERED IN 1933, GROSS TONS

States	Molten condition	Sand cast	Machine cast	Chill cast	Direct castings	Total
New York, N. J., Maryland	890,766	54,904	425,875	10,410	17	1,381,972
Pennsylvania	2,775,761	2,516	961,236	152,025	1,099	3,892,637
Virginia, West Va., Ala., Ky., Tenn.	775,393	20,343	636,539	12,691	459	1,445,425
Ohio	2,993,944	3,813	952,191	233	5,080	3,955,261
Ind., Ill., Mich., Iowa, Colo., Utah	2,125,212	20,632	520,422	.....	4,041	2,670,307
Total	9,561,076	102,208	3,496,263	175,359	10,696	13,345,602

METHODS BY WHICH BASIC PIG IRON WAS CAST OR DELIVERED IN 1933, GROSS TONS

States	Sand cast, machine cast, chill cast, etc.	Molten condition	Total
New York	87,488	310,936	398,424
Pennsylvania	620,204	1,751,987	2,372,191
Maryland, West Virginia, Kentucky, Ala.	138,437	1,151,616	1,290,053
Ohio	519,721	1,571,535	2,091,256
Ind., Ill., Mich., Colo., Utah	277,631	1,523,047	1,800,678
Total	1,643,481	6,309,121	7,952,602

EDITORIAL

Now Is Time for Industry To Assume Offensive

WITH congress adjourned, its members hastening home to mend political fences, the Chief Executive about to enjoy a well earned rest and several cabinet officers contemplating vacations, the routine of government soon will fall to the remaining members of the cabinet, to bureau heads and administrators.

This pending lull marks the first appreciable pause in the combined executive and legislative activities of the government since inauguration day in March, 1933. It affords a good opportunity to review the events of the past 16 months calmly and dispassionately, to differentiate the good from the bad and to check upon the direction in which we are tending. Industry, particularly, should utilize this brief respite to take stock of its position in relation to government policies.

In retrospect, the panorama from March 4, 1933, to date presents to fair minded industrial executives many government acts which elicit admiration and a few which can be viewed only with doubt and misgiving.

Industry Pilloried To Enhance Popularity Of New Deal in Mind of Public

In the latter category is the now clearly defined policy of the present administration to make industry one of the chief scapegoats of the "new deal." No matter how much one may admire the administration for its constructive accomplishments, one cannot escape the conclusion that much of the popularity of the "new deal" in the mind of the general public is due primarily to the adroit manner in which the President and his aides have pilloried industry, magnified its mistakes, ignored or discounted its achievements, distorted its good intentions and constantly held it up to the public gaze as an unscrupulous force which is antagonistic and destructive to the public interest.

It may be that the "new dealers" reason that industry is strong enough to survive the ordeal of being made a scapegoat—that industry should bear this sacrifice in order that public support for the new deal may be assured. However this theory—that the end justifies the means—can be of small comfort to industry.

The unenviable position in which industry has been placed by the present government administration points clearly to the strategy which industrial leaders should employ in this emergency. They should resolve immediately to carry their case direct to the public, to abandon their defensive position as scapegoat and to assume a militant offensive.

This involves a program of education. The entire strength of every branch of industry should be marshalled for duty in a campaign to inform the people of America of the true position of industry in relation to the public interest and to successful recovery measures. The time to launch this movement is now—while congressmen are talking with their constituents in regard to fall elections.

Plain Facts Pertaining To Fundamentals Will Influence Attitude of Man in Street

The only weapons required are facts, plus organization. The sponsors of the program should avoid propaganda and the tactics of lobbyists. Sincerity and simplicity in stating fundamentals should characterize every phase of the campaign.

Hopelessly confused by the loose talk of the period, the man in the street needs to be told the truth about the creation of wealth and its distribution. In simple language, he should be informed of the role of industry and agriculture as agencies in the generation of wealth, of the real owners of industry, of the actual beneficiaries of the fruits of industry, of the factors which affect and limit the amounts which can be paid out in wages, etc. He should know more accurately the relation government expenditures for relief and recovery bear to future distribution of dividends and wages. He should be given an unbiased statement of the advantages and disadvantages of various methods of collective bargaining.

Given a fair grasp of fundamentals, the public will quickly adopt a more understanding attitude toward industry. Moreover, if the educational job is done promptly and thoroughly, the results of it may influence the fall elections.

Industrial executives should begin now to sow the seed of truth in regard to industry. Fight for good representation in the next congress. Throw the influence of your support—not in accordance with the label of a political party—but to the men who can assure you they understand the position of industry.

THE INDUSTRIAL DIAL

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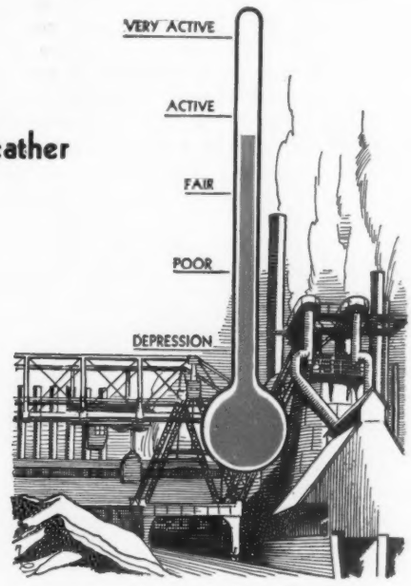
INDUSTRY faces the second half of 1934 under conditions somewhat different from those which have prevailed to date since the beginning of the "new deal." For this reason, a definite trend may not be discernible at once; probably the business world will feel its way slowly.

With the prospect of six months of freedom from new legislation, it would be expected that much of the confusion and hesitancy over the uncertainties of government action will melt away quickly, now that congress has adjourned. However, many of the laws enacted during the past session are written in broad terms. What their effect upon business will be depends as much upon how they are interpreted and administered as upon their wording or intent.

This means that business will continue to exercise extreme caution until the significance of the new laws is more clearly determined. Close attention will be given to the working of the securities exchange act of 1934. The appointments to the new commission of five will be scrutinized eagerly, because on Oct. 1 this body will assume administration of the new act, replacing the federal trade commission which administered the securities act of 1933.



From the standpoint of industry, the question of greatest moment is to what extent the new legislation and its administration will affect industrial financing. While the intent is clearly to regulate operations on exchanges, the powers permitted under the act for investigating the books of corporations, for prescribing uniform reports, etc. will compel the close attention of every industrial concern.

Management also will exercise caution until the purpose of the new labor relations act is clarified. Unless the permissive provisions of this eleventh-hour makeshift are administered fairly, it may magnify the difficulties which were precipitated by the ambiguity of section 7a of the recovery act.

Industry also awaits a clearer statement of the price policy of NRA. Unquestionably the government intends to weaken the price control provisions which were written into the original codes. The change in policy may develop slowly, nevertheless it will have an important bearing upon industrial operations during the last half.

Where Business Stands

Monthly Average, 1933—100

	May, 1934	April, 1934	May 1933
Steel Ingot Output	170.5	159.1	100.5
Pig Iron Output	182.9	159.8	57.6
Freight Movement	108.5	104.8	95.6
Building Construction	.....	115.9	100.3
Automobile Output	207.4	224.6	112.7
Wholesale Prices	116.3	116.5	102.0

Legislation pertaining to loans to industry, home mortgages, housing, and agriculture also awaits trial. Industry will want to know whether any one or a combination of these will help to shift the incentive for investment from government shoulders to those of private citizens.

Even more important to industry is the matter of prices. Many months have passed since administration leaders have talked about restoring prices to 1926 levels. Has the administration changed its goal for prices? In fact, is it not possible that the long term trend points toward moderate prices? The disparity between the prices of manufactured goods and farm prices remains as great today as it was a year ago. The conflicting aims of various Washington agencies points to a need for a strong co-ordinating force in the federal government.

In view of these uncertainties, business may not enjoy its vacation from congressional action as thoroughly as was expected. However it resisted obstruction vigorously during the first half, and probably will be even more militant in the final half.

The peak of the spring activity now seems to have passed. A slower pace is definitely at hand. The lull may provide a good opportunity for digesting the work of the seventy-third congress, and it may prove to be the spring board for increased activity in the fall.

Thumb Nail Sketches Of Business

Bituminous coal production in the first five months of 1934 totaled 155,105,000 tons, compared with 119,890,000 in the same period last year. Abnormal conditions due to code regulations carried production to a peak in the week ending March 31, in which the daily average output topped that of the corresponding weeks for four years. Due to this abnormal production in March, output dropped sharply in April, and since then has held a fair margin over 1932 and 1933 levels.

Predict Higher Copper Prices; Stocks Reduced

Recent talk of higher prices for copper were confirmed Tuesday by H. O. King, former NRA divisional administrator and now impartial administrator of the copper code. Speaking at the convention of purchasing agents, Mr. King declared that few companies can earn a profit with the metal priced at 9 cents. In terms of gold, he pointed out, the 9 cent price is equivalent to only 5.4 cents per pound. Previously, copper authorities had predicted 10 cent copper before the end of the year. Stocks of refined copper in the United States were reduced from 476,500 tons of April 30 to 461,100 tons on May 31.

Farmers' Purchasing Power Unchanged

According to the monthly bulletin of the bureau of agricultural economics of the United States department of agriculture, the ratio of prices received by farmers for their own products to the prices they pay for manufactured goods was 61 per cent in May, 1934. The index number for prices received stood at 74 and the index number for prices paid was 121. In May, 1933, prices received were at 62 and prices paid at 102, the ratio being 61. In other words, while prices of farm products and manufactures increased, the ratio remained unchanged.

Machine Tool Order Index Is Revised

The index of machine tool orders compiled by the National Machine Tool Builders association has been changed to include orders for all members of the machine tool and forging machinery industry code. The base, which was average monthly shipments for 1922, 1923 and 1924 equals 100, has been changed to average monthly shipments for 1926 equals 100. This has the effect of lowering the index and necessitates a new chart, which will be presented in the July 2 issue of STEEL.

Foundry Equipment Orders at Higher Level

Orders for foundry equipment, which have held consistently at low levels since the first quarter of 1931 (with the exception of a brief spurt early in 1933), now have continued in the range of 60 to 75 index numbers for four consecutive months. This is by far the best record for several years.

Is Power Output Good Indicator?

A glance at the chart of electric power output (page 26) shows that this barometer shows the low point of the depression in July, 1932, more clearly than most of the general indices. While seasonal factors may have accentuated this point, the fact remains that the trend of power output reflects the over-all course of business quite faithfully. Perhaps this barometer is more reliable for general use than has been realized.

What Scaling Down Debts Means in Wages

Samuel O. Dunn, editor of *Railway Age* recently explained to members of the Executives' Club of Chicago the fallacy in the proposal of reformers to scale down the indebtedness and fixed charges of the railroads to enable them to stabilize employment and wages. He showed that if all the annual increase in interest upon indebtedness since 1916 had been paid to employes, it would have increased wages only 3½ per cent in 1929 and 6 per cent in 1933.

The Barometer of Business

Industrial Indicators

	May, 1934	April, 1934	May, 1933
Pig iron output (Daily average, tons)	66,274	57,873	20,867
Machine Tool Index	46.8	48.5	10.6
Finished steel shipments (tons)	745,063	643,009	455,302
Ingot output (Daily average, tons)	125,807	117,425	74,148
Dodge Bldg. awards in 37 states (sq. ft.)		14,207,100	12,295,700
Automobile output	*350,000	378,983	190,204
Coal output, tons	27,246,000	24,977,000	22,488,000
Business failures, number	977	1,052	2,688
Business failures, liabilities	$22,560,835	$25,736,975	$76,931,452
Cement production, Bbls.		6,544,000	6,266,000
Cotton consumption, bales		513,000	621,000
Car loadings (weekly av.)	604,039	583,708	531,960

*Estimate.

Foreign Trade

	May, 1934	April, 1934	May, 1933
Exports		$176,499,000	$114,000,000
Imports		$141,137,000	$107,000,000
Gold exports		$37,000	$22,024,000
Gold imports		$52,279,000	$1,785,000

Financial Indicators

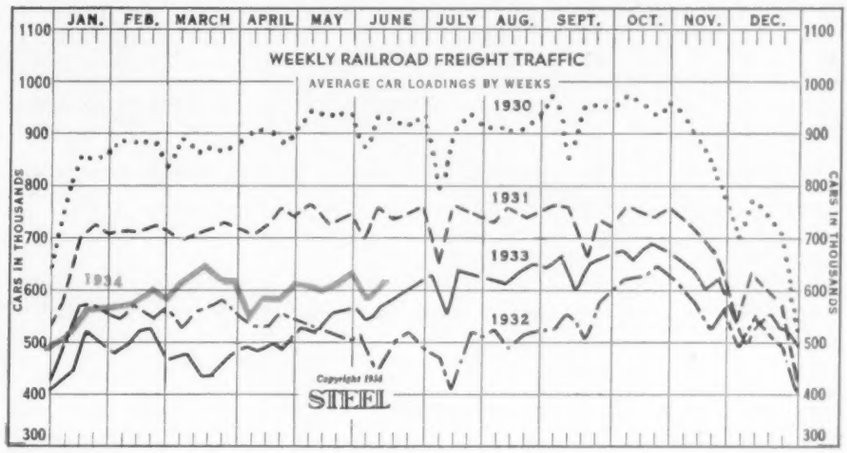
	May, 1934	April, 1934	May, 1933
25 Industrial stocks	$131.17	$144.84	$118.30
25 Rail stocks	$34.15	$39.88	$31.01
40 Bonds	$82.24	$83.94	$69.74
Bank clearings (000 omitted)	$17,952,982	$21,511,812	$16,064,116
Commercial paper rate N. Y. (per cent)	1	1¼	2
*Commercial loans (000 omitted)	$4,550,000	$4,604,000	$4,772,000
Federal Reserve ratio, per cent	69.0	69.2	68.0
**Railroad earnings	$32,264,609	$52,047,881	$19,041,789
Stock sales, N. Y. stock exchange	25,343,000	29,846,502	104,229,094
Bond sales, par value	$284,742,800	$362,200,700	$373,966,500

*Leading member banks Federal Reserve System.
**April, March and April, respectively.

Commodity Prices

	May, 1934	April, 1934	May, 1933	Monthly Av. 1913
STEEL's composite average of 14 iron and steel prices	$34.77	$34.18	$28.45	$26.32
Bradstreet's index	$9.14	$9.15	$8.02	$9.21
Wheat, cash (bushel)	$1.07	98c	99c	92c
Corn, cash (bushel)	66c	61c	58c	51c
Petroleum, crude (Bbl.)	98c	98c	25c	$2.50

	1934	1933
June 9	615,565	564,546
June 2	578,541	512,974
May 26	624,567	545,551
May 19	611,142	535,719

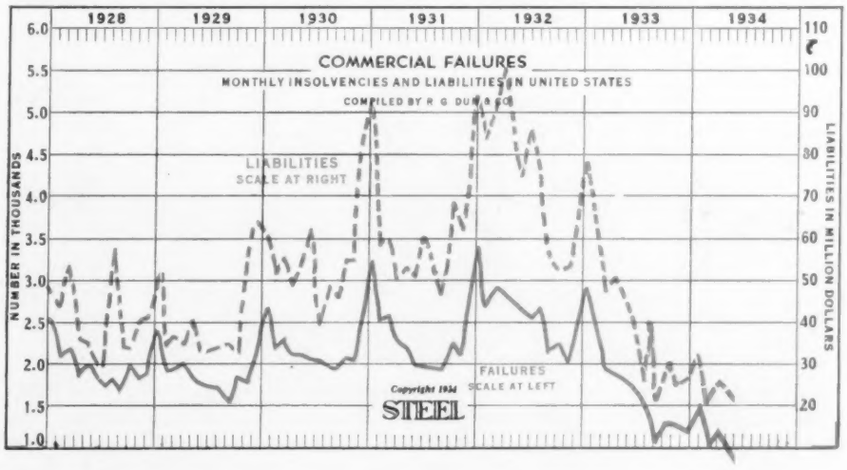


Freight Car Loadings Rebound Following Holiday

Freight car loadings in the week ended June 9 totaled 615,565 cars, according to the weekly report of the American Railway association. This was a gain of 37,024 cars over the preceding week, a gain of 46,408 cars over the movement in the corresponding week of 1933 and a gain of 113,880 over the same week of 1932. The total movement for the June 9 week was an increase of 6.4 per cent over the preceding week which included Decoration day. This rise was smaller than the usual seasonal increase when compared with corresponding weeks over a period of the past 15 years. All commodities with the exception of coke and livestock registered increases in the June 9 week compared with the preceding seven days.

Commercial Failures Lowest Since October, 1920

Commercial failures in the United States in May declined to the lowest level for any month since October, 1920. According to the records of Dun & Bradstreet, Inc., failures number 977, with an aggregate indebtedness of $22,560,835. The previous low for May was in 1920, when 547 insolvencies were reported. In April of this year there were 1052 defaults, while during May, 1933 there were 1909 similar failures. Liabilities in May were, with the exception of February, 1934, and September, 1933, under any monthly liability total since July, 1920. April liabilities totaled $25,786,975 while the indebtedness in May, 1933 was $47,971,573. The highest total recorded for May was in 1932, when liabilities amounted to $83,763,521.

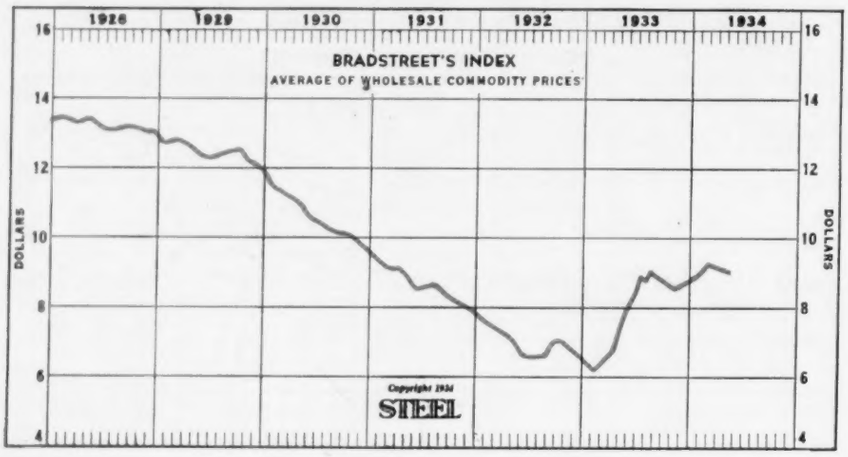


Number

May, 1934	977
April, 1934	1,052
May, 1933	1,909

Liabilities

May, 1934	$22,560,835
April, 1934	25,786,975
May, 1933	47,971,573



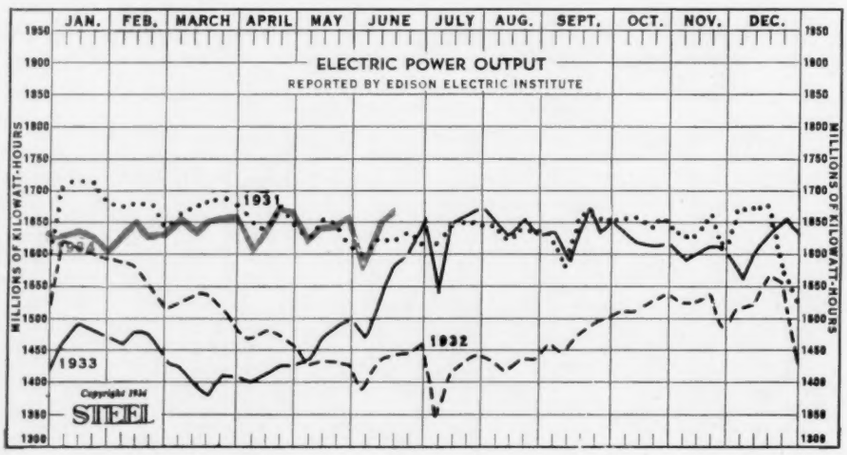
	1934	1933
June 1	$9.14	$8.02
May 1	9.15	6.98
April 1	9.16	6.53
March 1	9.26	6.35
February 1	9.01	6.53
January 1	8.83	6.79

Commodity Price Index Off Moderately

Bradstreet's index of wholesale commodity prices on June 1 declined slightly to $9.14, a drop of only 0.2 per cent from the May 1 index of $9.15. This latest decline followed a similar loss on May 1 and a drop of 1.0 per cent on April 1, making a total loss of 1.3 per cent since March 1 when the index registered the highest point this year at $9.26. Compared with the index on June 1, 1933, which stood at $8.02, there has been an increase of 14 per cent. The sharp rise in grains during May, due to the continued drought, strengthened many of the other commodities and most of the indices closed the month at a higher position than when it opened.

Electric Power Output Expands Sharply

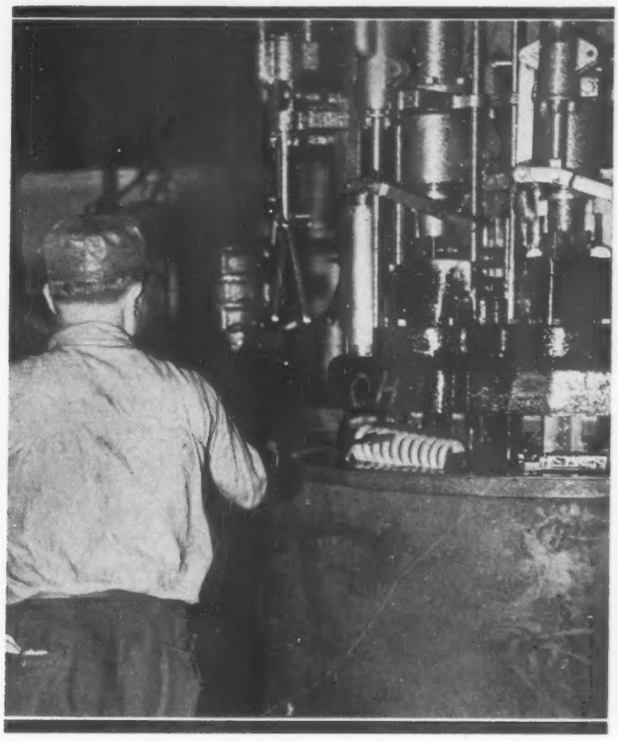
Production of electric power in the United States during the week ended June 16 was 1,665,358,000 kilowatts. This was a gain of 5.5 per cent over the 1,578,101,000 produced in the same period of 1933. The total for the week ended June 9 was 1,654,916,000 kilowatts, against 1,541,713,000 in the corresponding week in 1933. The June 2 total at 1,575,828,000 represented a gain of 7.8 per cent over the production rate of 1,461,488,000 in the 1933 period. In the Central industrial district last week's output was 7.3 per cent greater than a year ago while in the preceding week there was an increase of 10.3 per cent over the 1933 week.



Million Kw.—Hr.	1934	1933
June 16	1,665	1,578
June 9	1,654	1,541
June 2	1,575	1,461

MANUFACTURING "KNEE-ACTION" SPRING SUSPENSIONS

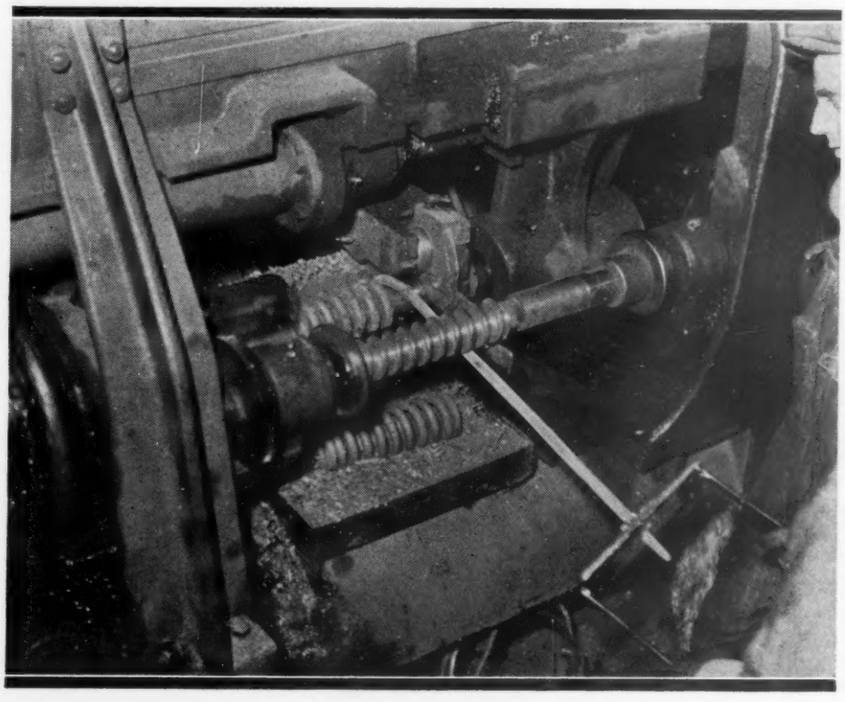
BY A. H. ALLEN
Associate Editor, STEEL



Heated coils are oil quenched in this 12-sided quenching machine, which holds the coils rigidly to shape

CHEVROLET knee-action assemblies are currently flowing through manufacturing processes at a rate of 210 sets an hour, 22½ hours a day. This figure, contrasted with the comparatively modest production rates for Cadillac, La Salle, Buick and Oldsmobile, indicates the magnitude of the problem which confronted Chevrolet engineers when the change in suspension design was projected. Every day now, 4725 assemblies, comprising not only spring actions, but brakes and brake drums, steering connections, shock absorbers and front cross members are shipped from the Chevrolet gear and axle plant at Detroit to nine assembly plants throughout the country. All the parts, including the coil springs, are made in this plant.

As indicated in the first installment of this article, Chevrolet has adopted the enclosed type suspension in which, the entire housing, with its coil spring, shock absorber and other parts turns (in steering) on the kingpin, by which it is attached to the chassis front-end assembly.



Forming a Chevrolet coil spring from a red hot bar of alloy steel. Deep-cut spiral lead screw insures proper spacing of the coils as they are formed on the mandrel

THIS is the second of two articles dealing with materials, methods and equipment used in the manufacture of independent springing systems for General Motors Corp. automobiles. The first was published in last week's issue of STEEL *and discussed the open-type springing adopted by Cadillac, La-Salle, Buick and Oldsmobile. The current installment gives details of the enclosed "knee-action" unit, found on Chevrolet and Pontiac models.*

BEARING bosses are automatically welded into the stamped steel housing in this electric welder. The housing is given one full revolution as the weld is being made

The wheel is mounted on its spindle at the rear end of the support arm, which is attached at its forward end to a splined shaft turning on needle bearings within the housing. A short lever on the splined shaft, within the housing, ends in a roller bearing mount carrying a movable spring seat that rests against the lower end of the coil spring. Vertical movement of the wheel at the outer end of the support arm turns the splined shaft against the resistance of the spring pressure on the short lever.

Besides serving as a mounting for the spring mechanism, the stamped and welded housing fulfills two other main purposes—protecting the spring from the weather and from mechanical injury, and providing an air-tight reservoir for the oil that is not only a lubricant but also fluid for the hydraulic shock absorbers.

Scratches Localize Stresses

In the manufacture of coil springs, unusual care is taken to avoid scratching or marring of the surface, since this would tend, through localization of stresses in action, to be a source of failure. A housing, made from two stampings of hot-rolled low-carbon strip steel, 5/32-inch thick, and welded together to be leakproof, completely protects the spring coil.

Fabrication of this housing and its assembly in the unit presented some problems, now solved, which at one time held up car assemblies for a short time. It is formed by butt welding the two stampings, this work being done in a battery of four electric welding machines. Each half is clamped in a fixture and held firmly against the other by hydraulic pressure to insure close contact during the welding. The housing undergoes its first test under air pressure immediately, to detect any leaks in the welded seams or through the metal itself. Various machining operations follow. First, the top of the cylindrical upper end is threaded to receive the cover. The steering knuckle forging then is attached by welding to a rectangular projection of the housing wall.

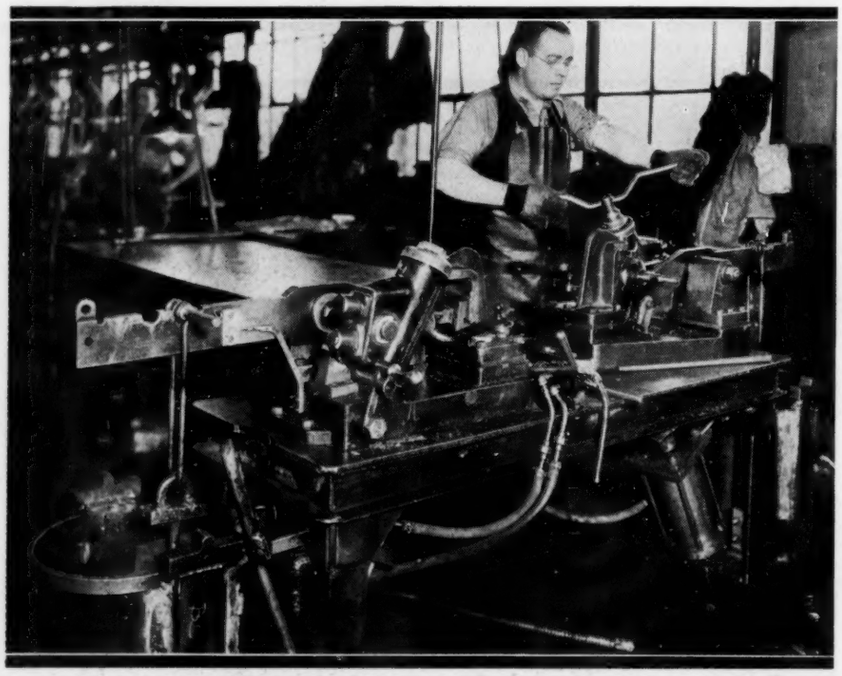
Welding of an alloy steel forging to a low-carbon steel stamping called for some ingenuity. A double welding method was adopted—first an electric butt weld, followed by arc welding with a coated low-carbon steel rod. Welding strains are removed by heat treatment, so regulated as not to decrease the hardness of the steering knuckle and bearing bosses. Finally, the bearing holes are sized and smoothed, and the forward face of the housing wall is smoothed to provide a seat for the flanges of the two shock-absorber cylinders.

Silicomanganese Steel Used

For spring coils, Chevrolet uses S.A.E. 9260 steel, purchased in the form of hot-rolled round bars sized to 0.7035-inch by one cold roll pass. A section of the rod is cut to 93½ inches and ground smooth in centerless grinders to 0.6875-inch diameter, ultimately forming a single spring of 10½ to 11 coils.

After grinding spring rods to size, a careful inspection of the bar is made, any with nicks and scratches being rejected. Diameter is held within limits of plus or minus 0.001-inch. Ends of the bar are then heated and inserted in a special point-rolling machine, to taper the ends so that they will lie snugly against the adjoining coils.

Before coiling, the bars pass through a pusher-type furnace, where they are heated to 1600 degrees.



This machine performs the final load test on the spring unit. Full compression of the spring is obtained by pneumatic power added to the load of a 700-pound weight on the lever arm. Operator at the right is tightening the spring seat to correct spring setting

They are then fed to the coiling machines, arranged in a battery of four units. One worker inserts the pointed end into the coiler, while another supports the other end in a special handling tool. As the bar is inserted in the machine, jaws grip the tapered point and draw it around a revolving arbor. The arrangement is similar to that already described for Cadillac and Buick springs.

As the springs are removed from the coiler, they are placed in separate cradles of an endless chain conveyor that passes through a furnace where temperature is held at 1600 degrees. Quenching is carried out in a 12-sided quenching machine, with each spring held to its proper length and clamped firmly to maintain length and diameter. Except for loading and unloading, the machine is automatic. The springs are drawn at 950 degrees Fahr. and quenched in water.

Given Compression Test

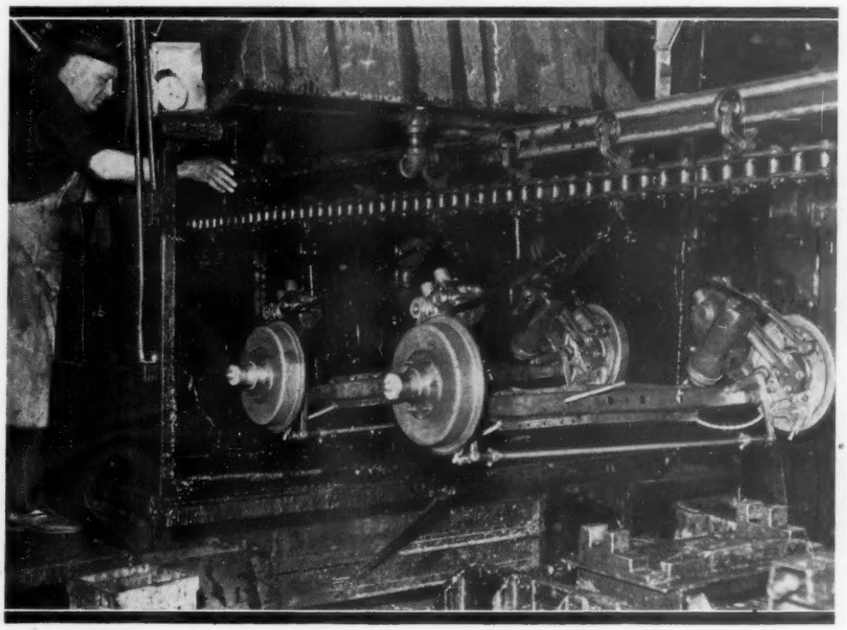
A testing requirement is that the spring must be capable of being compressed 30 times under a 5000-pound load with not more than 50 pounds decrease in the pressure exerted when compressed to 8 inches.

Remaining operations are for sizing and cleaning. The spring passes twice through a 16-station grinder, each end in turn being ground smooth and flat. This operation reduces the length to 9 11/16 inches, and at the same time insures that the ends are parallel to within 0.005-inch. Exact parallelism is required to prevent buckling when the spring is in action.

After brinell tests for hardness, the springs are cleaned in a shot blast, scouring the surface inside and out. The load test follows, the spring being checked for height when compressed solid, for load at 8 inches and for compression rate per inch. The springs travel by conveyor to be loaded for transportation to the point of assembly in the front end units.

The finished spring, 3 19/32 inches in outside diameter, and 9 11/16 inches high without load, has a compression rate of one inch for each 1520 pounds of load. Under a load of 3830 pounds, the coils are compressed solid, to a length of 7.2 inches. Normal length of a spring in a standing car with curb load (water, oil, gas; no passengers) is 8 inches. This represents a load of 2620 pounds on the spring, since the actual weight it supports is increased 3.52 times by the leverage of the support arm. The same ratio applies to spring movement, the total spring travel of 1 15/16 inches representing 6.8 inches of wheel travel.

FORGING the steering spindle in one of the 24 steam hammers operated in the forge shop to produce parts for the knee-action assemblies



Completely assembled front end units on conveyor before painting. This shows clearly how the spring element is mounted with respect to the wheel

Support Yoke Flange Extruded

Two unusually difficult extruding or hot pressing operations mark the fabrication of the kingpin support yoke and the steering knuckle. The support yoke is to be welded to a steel stamping forming a part of the front cross member of the chassis; the steering knuckle is welded to a rectangular projection formed in the stamping of the knee-action housing. For butt welding, it is required that the face of the forgings be flanged to the same thickness, 5/32-inch, and to the same contour as the pressed out projections of the stampings.

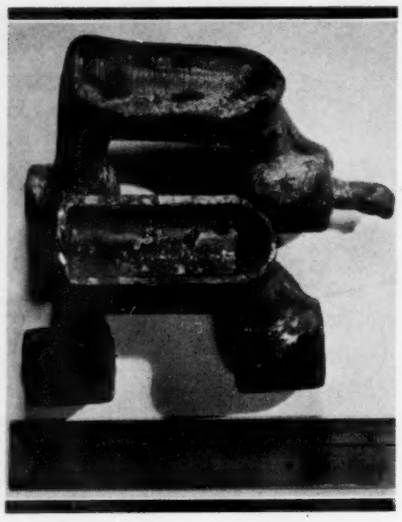
Chevrolet resorted to an unusual application of the extruding method to produce on the forgings the deep flanges to correspond to the pressed steel units. The part, in each case,

is forged from bar steel in a 2500-pound steam hammer, then hot-trimmed to remove the flash. It is then placed in a vertical press. Dies hold it to the proper outside dimensions, while a descending punch, under hydraulic pressure, presses upon the blank, causing the hot metal to flow upward between the dies and the punch, forming the flange, as shown in one of the accompanying illustrations. A shoulder on the punch limits the height of the extruded flange, the excess metal being pressed outward between this shoulder and the dies. After hot trimming and heat treating, the part is ready for machining.

Severe tests are applied to the welds that join the kingpin support yoke and the steering knuckle to the steel stampings. The former receives a torsional test equivalent to the load of a 200-pound weight on a 10-foot radius. The knuckle weld is subjected to a shock test. A similar test is given the two support arm bearing bosses, which are welded to the housing.

Other Forgings Employed

Other parts of the assembly produced in the Chevrolet forge shop are the front-wheel support arm, which serves as the connecting link between the chassis and the front-wheel spindle, actually supporting the weight of the car; the front wheel support lever, which operates within the housing on the same splined shaft to which the support arm is attached, to bear against the movable spring seat; and the knee-action radius rod, mounted parallel with the main support arm, connecting the housing and the brake shoe anchor plate, to prevent rotation of the brake assembly about the spindle when the brakes are applied. The support arm and radius rod are of chrome-nickel steel; the short support lever is nickel-molybdenum steel. Twenty-four steam hammers and 400 men are engaged continuously in the forging of these and other knee-action parts.



Kingpin support yoke, before and after the flange is formed by a heavy extrusion operation. The forging is welded to the stamped steel front cross member

To obtain bearings of maximum smoothness and hardness, a new application of roller burnishing has been made on certain bearing holes. Each knee-action assembly has eight antifriction bearings of the needle-roller type. By roller burnishing the bearing holes, the surface on which the needles roll is given a polish equivalent to that which would be obtained on actual use in hundreds of miles of car operation.

This burnishing method heretofore has been applied to softer bearing surfaces, but it is believed that this is the first example of its use on hard alloy steel. Bearing holes are diamond bored and reamed; then the roller burnisher is applied in a drill press. A mirror-like finish is obtained, as well as accurate sizing.

Simple Forming Operations on Stainless Strip for Radiator Moldings

USE of stainless steel in automotive parts has been fairly widespread, including such items as radiator shells, headlamps, grilles, windshield trim, hood hinges and miscellaneous hardware. High cost of the material in some cases has worked to a disadvantage in furthering its application, but a number of parts continue to be made of the chrome-nickel, straight-chrome and other variations of stainless.

A leading supplier of this type of automobile material, the Motor Products Corp., Detroit, from time to time has handled a number of jobs of stainless steel, one currently in production being the narrow bead which is clipped on the Ford radiator between the chrome-plated steel shell and the radiator grille. This piece is known as a radiator shell molding and is of 23-gage 18-8 chrome-nickel steel formed in one piece about 85 inches long, clipped at the bottom.

Stock is received in the form of coils of 4½-inch cold-rolled strip, about 500 feet in length. This is run through a slitter, where 1/16-inch is trimmed off each edge and the balance slit into ¾ or ½-inch strips, depending upon whether the molding is to be for passenger car or truck models. The material is coiled as it comes off the slitter and taken to a four-stand roll-forming machine where the contour of the piece is formed by hard steel rolls, strips are cut to proper length and are given a slight bow in a brass die as they emerge from the machine. Cross section of the molding resembles approximately a small keyhole, with the rounded portion being on the outside, the shape being designed to accommodate small wire clips or "hairpins" which hold the piece in place.

Three Bending Operations

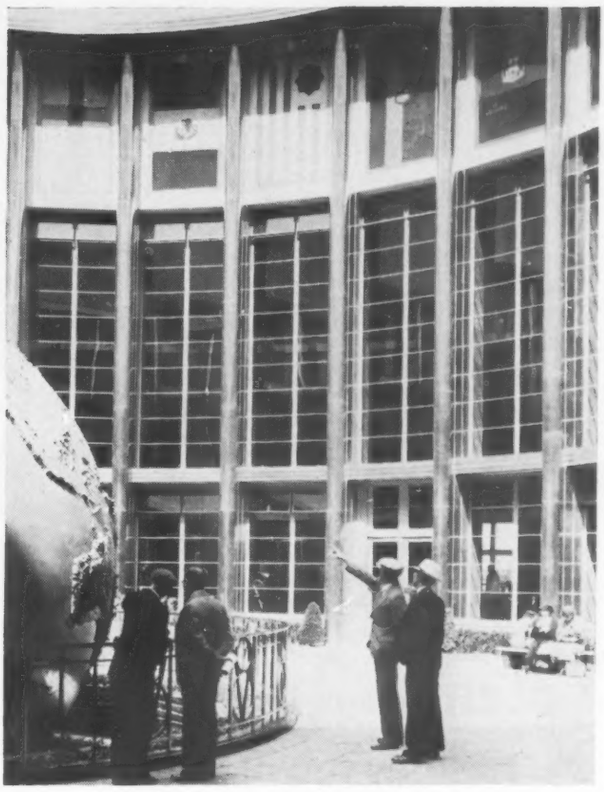
The bowed strip is taken to a bending machine where it is clamped and two men attach fixtures or arbors which are pulled over a die to give proper curvature to the upper portion. Ordinary lubricating oil is used in the die fixtures. A second similar bending operation is performed in another machine, the bottom ends being turned into meet each other, to be held together by a small stainless steel clip when installed. These bending machines and fixtures shape the molding to the contour of the radiator without flattening the curved bead when pulled around the dies.

A third bending operation is carried out in a small press provided with a die which gives the V-shape to the top of the bead. Following these treatments, the moldings are conveyed to buffing machines where a bright finish is obtained by polishing against wheels built up of canvas disks to which is applied a special type of stainless steel buffing compound, purchased in brick form and rubbed on the wheels as they rotate. A few minutes of polishing on these wheels gives a bright lustrous finish on the molding, which closely matches the bright finish of radiator shell and grille.

Fastening pins are slipped into the moldings and they are packed in bundles for shipment to Ford assembling plants. The complete operation of forming this part is accomplished quickly and with standard equipment. Labor includes one man for the slitter, one man for the roll forming machine, five men on the bending operations and a crew of three or four on the buffing wheels.

Where stainless steel must be matched perfectly with a chrome-plated finish on certain auto parts, it is often advisable to use straight-chrome grades which have a whiter appearance than the chrome-nickel stainless steel. Further, the straight-chrome variety can be purchased at a saving in cost approximating 7 cents a pound.

Chrome-Plated Copper Sheets Decorate New Exposition Building



SATIN finish chromium plate is employed on the 32 metal-sheathed columns in this Court of the World, a central rotunda in the building

VISITORS to A Century of Progress exposition in Chicago are being introduced to a brilliant spectacle in the new Ford exposition building, conceived and developed by Albert Kahn, Detroit architect, who has used chrome-plated copper as the dominant note in decoration.

The chromium which adorns the Ford building differs from the bright, highly reflective chromium plating in common usage. It is finished in a soft, satin sheen, easy to look at in the sunlight, but just as resistant to tarnish as the bright finish. This development was made in the laboratories of the Apollo Metal Works, LaSalle, Ill., the material being known as ChromCopper. More than 20,000 square feet of this plated copper was required, besides 4200 square feet of bright finish ChromZinc, a material used for light reflectors. On the east balcony of the building chrome-plated copper is used for facia and soffit panels. The east entrance, shown in the illustration below, is completely covered with satin chromium. The canopy under which all pass who enter the building is one unbroken chromium surface. In the court, shown in the illustration above, each of the thirty-two towering columns is faced with the same metal. In the historical exhibit ChromCopper reaches completely around the walls near the ceiling. It is also present on panels on the interior of the balcony.

The plated copper sheets are light and only 0.018-inch in thickness. For reinforcement, the sheets are cemented to a plymetal backing, the edges turned over and fastened on the reverse side and then backed up with a light sheet of steel. This reinforcing work was done at the plant of the Haskelite Mfg. Co., Grand Rapids, Mich. Incidentally, there are some 2600 individual panels in the Ford building.

Brilliant illumination is made possible by reflectors of rolled zinc plated

(*Please turn to Page* 51)

Main entrance to the building, with formed sheets of chrome-plated copper carrying out the modernistic theme of the architecture

FIG. 1—Built of sheets and structural shapes, this grade crossing guard is raised by a motor and spring arrangement, actuated by an approaching train through electrical contact with the rails

Automatic Crossing Guard a Potential Tonnage Market

BY EDWARD A. FRANCE JR.
Associate Editor, STEEL

WHAT promises to be a new and large use for steel, opening a potential market for thousands of tons of channels, floor plates, strip, shafting and coiled springs, is being perfected for actual use in the form of a new vehicular safeguard for railroad crossings. In the form of a steel box, placed beneath the roadway one on either side of a grade crossing, this new appliance is designed to raise automatically a 12-inch high steel obstruction, with concave face, to motorists upon approach of a passing train.

Because the raised obstruction is placed the full width of the roadway, when raised, passage by the automobile is impossible. The raised part is lettered with stop signs and carries red reflector lights as shown in Fig. 1. In addition, a signal bell rings from the time the protector starts raising until the train is passed. Each protector is placed approximately 50 feet from the railroad track on either side.

Held Up by Springs

As shown in Fig. 3, the concave face of the protector arrests the progress of front wheels of an automobile approaching railroad tracks, while a car which has already crossed the tracks after the protector has raised passes easily over the raised guard, Fig. 4, by depressing it to the level of the road. Springs in the mechanism raise the section when the car has passed over it, this position being held until the passing train has broken a contact, allowing the guard to descend to a flush position. Fig. 2 shows a car passing over the device when it is closed.

Side walls of the box construction are formed from 12-inch steel channels, running the entire width of the road, usually from 30 to 45 feet. A complete roadway installation will be made up of sections from 6 to 9 feet long. The top of the device is made from floor plates, in sections approximately 15 inches wide and the full width of the roadway. End walls and bottom plate are of heavy sheets.

Within the box, the lifting of the lid top is accomplished by the use of two shafts and coiled springs. A 10-volt, ¼-horsepower motor, wound for either alternating or direct current, supplies the lifting power. Usual source of power is alternating current, with five 2-volt signal batteries used as auxiliaries.

It is claimed that electrical operating cost of a set of two of these crossing protectors can be confined to a charge of $3 yearly, on the basis of operating 35 trains daily. Total maintenance cost per set is estimated at $100 yearly.

Evans Products Co., 2336 Union

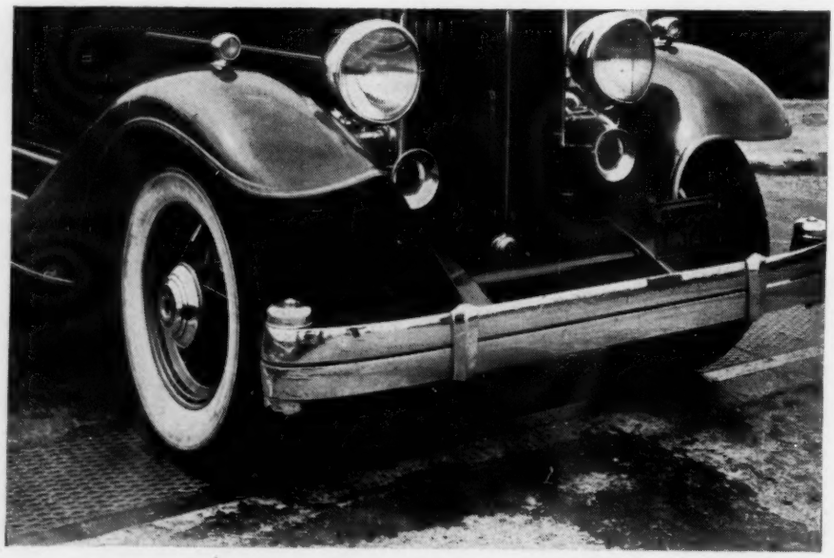


Fig. 2—Top of the guard is covered with steel floor plate, flush with the road when in the closed position

Guardian building, Detroit, in conjunction with R. C. Mahon Co., Detroit, structural engineer and fabricator, is perfecting this device. It has been satisfactorily and economically in use in several actual installations recently, among which are crossings at Eleven-Mile road and the Grand Trunk Western railroad on the Port Huron, Mich., division, near Detroit; another at Foster street and the Louisville & Nashville railroad, Nashville, Tenn.; and a third near 610 Whitehall street, Atlanta, Ga.

Fig. 3—Concave face of the guard provides an effective barrier for cars at a crossing where a train is approaching

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Aluminum castings to be arc welded should be prepared by grinding, filing or scraping clean an area 1-inch wide completely surrounding the part to be welded. On large areas the casting should be heated just above the temperature at which the hand may be held on the metal without discomfort.

British Foundrymen Conduct Conference in Manchester

BY VINCENT DELPORT
European Manager, STEEL

FOUNDRY practice, mechanization, apprenticeship, physical properties of cast iron, effect of phosphorus in cast iron and standard test bars were among important topics discussed at the thirty-first annual conference of the Institute of British Foundrymen held in Manchester, England, June 5-8. The meeting was well attended.

Roy Stubbs, Joseph Stubbs Ltd., Openshaw, was elected president. J. E. Hurst, technical director, Bradley & Foster Ltd., and of Sheepbridge Stokes Centrifugal Castings Co. Ltd., was named senior vice president; and H. Dinterton, Wm. Cumming & Co. Ltd., junior vice president.

The meeting approved award of the Oliver Stubbs medal to V. C. Falkner, editor, *Foundry Trade Journal*, who apart from the services rendered to the institute over a period of years, was largely responsible for successful materialization of the scheme to establish a university degree in founding. The medal for long and meritorious service was awarded to J. J. McClelland, honorary secretary of the Wales and Monmouth branch of the institute.

The conference opened formally on June 6 with C. E. Williams in the chair. A civic welcome was extended by the Right Honorable the Lord Mayor of Manchester, Alderman Joseph Binns who was supported by B. Mouat Jones, M. A., principal of the Manchester College of Technology.

T. Makemson, secretary of the institute, read a cabled greeting from Frank Lanahan, president, American Foundrymen's association, which contained an invitation for members of the Institute of British Foundrymen to attend the Fifth International Foundry congress and exhibition in Philadelphia next October.

Installed as the new president, Roy Stubbs presented the presidential address. After emphasizing the fact that a foundryman's work is essentially creative work, the president referred to developments which have taken place in the technique of the foundry industry in recent years, and pointed out that the institute has taken a prominent part in these developments.

He emphasized that "the foundry product of today has been brought to a very high quality from the standpoint of operating performance and safety."

After the conclusion of his speech, the president made the formal announcement that a degree in founding has been established at the University of Sheffield, under chairmanship of Prof. J. H. Andrew.

A report of the work of the cast iron subcommittee of the technical committee, entitled: "Total Carbon and Phosphorus in Relation to the Porosity and Strength of Cast Iron—Contraction—Carbon Pick Up—Microstructures—Wear Testing," was made at a technical session on June 5. The report was presented by P. A. Russell, chairman of the subcommittee.

Favors Proposed Test Bars

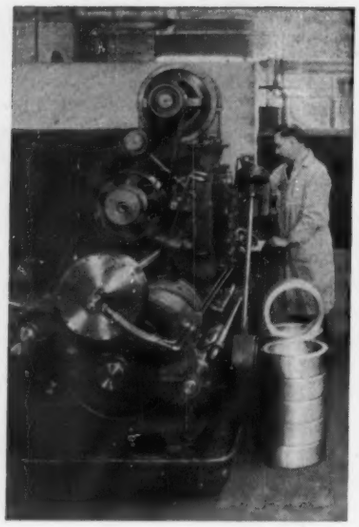
Opening discussion, Prof. Campion referred to the test bars used by the subcommittee and stated that he was in favor of adopting the specifications proposed. The larger bar of 2.2 inches, used by the subcommittee was described as causing the edges of the testing machine to dig into the bar; this, Prof. Campion stated, could be remedied easily. He urged that further investigations be made with regard to phosphorus; phosphorus can be a friend as well as an enemy, and in certain types of castings it can be used to advantage.

J. G. Pearce said there have never

(*Please turn to Page 45*)

Fig. 4—A vehicle approaching from the opposite direction rides easily over the raised guard, depressing springs which hold it in the "stop" position

Making the Most *of* METHODS AND MATERIALS



Style Trends and High Cost Restrict Stainless Use

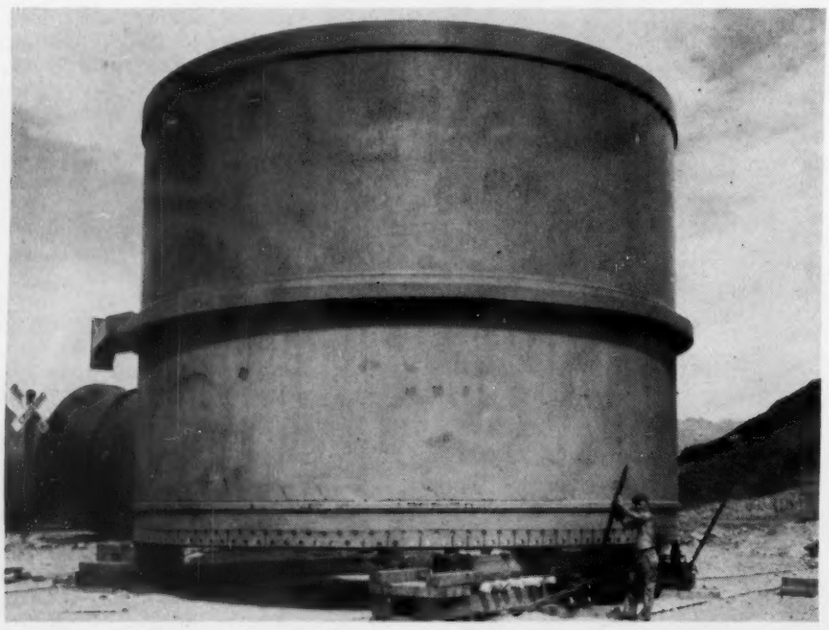
High cost of stainless steels and improvements in quality of chromium plate have continued to restrict the use of the former to such parts as cannot be made satisfactorily or economically in other ways. For instance, a $2 cost per car for stainless steel bumper bolts is a standing challenge for a more economical material. Trends of style also have restricted bright work on the body; generally a few lines of molding, trim around windshield and split windows, and a radiator grille will be the limit (see p. 30).

$ $ $.

Welding Broken Press Frame Saves Time and Expense

Arc welding saved $200 for an Ohio pressed steel company in the repair of a cast-iron punch press frame which had broken at one bearing. In addition, the press was back in service 36 hours after the break occurred. The welding contractor called in prepared the break for welding by cutting away enough of the cast iron around the break to permit insertion of a number of steel studs—the customary practice with cast iron in order to obtain a strong, solid joint. The operator then applied a double layer of the proper welding electrode, which gave a layer of metal strongly bonded to the cast iron. Another type of electrode was used to fill in the remainder of the gap on both sides of the bearing because of the saving in time and cost afforded by this particular electrode. In all, about 75 pounds of electrode were consumed in the repair. The cost of a new frame, exclusive of its installation would have been $200 greater than the cost of the welding job and the press would have been out of service for a longer period.

$ $ $



STEEL PIPE SECTION FOR BOULDER DAM HAS 30-FOOT DIAMETER: Formed and welded from 2-inch steel plate, this huge cylinder, about 24 feet high, comprises an erection section for main conduits at Boulder dam to lead water from intake towers to the penstocks. The section was fabricated at the field plant of the Babcock & Wilcox Co., near the dam, and has been placed in a storage yard awaiting transportation to the rim of the canyon, where it will be lowered by cableway to the conduit tunnels about 400 feet below. Weight of the section is 150 tons. Nearly 14,500 feet of this pipe, ranging in diameter from 30 down to 8½ feet, will be required, calling for over 50,000 tons of steel plate (see STEEL, *Dec.* 18, 1933, *p.* 21)

Coat Molds To Reduce Chill Effect on Cast Pipe

In a recent proprietary process developed for decreasing or eliminating the chill effect in centrifugally casting iron pipe in iron molds, a thin coating of powdered metallic or nonmetallic substance is applied to the mold surface 6 seconds before the molten metal is permitted to strike it. Control of the coating thickness is important, and the following limits are mentioned: Ferrosilicon (30 mesh), 0.0003-inch; Kaolin, 0.0009-inch; talc, 0.0009-inch; magnesite 0.0005-inch; ferromanganese, 0.0007-inch; mica, 0.0008-inch; zirconium-manganese-silicon, 0.0008-inch; and seacoal, 0.001-inch. The coating is applied by mixing with compressed air and forcing it through a nozzle situated just back of the pouring spout.

$ $ $

Spray Heat-Exposed Parts

The life of gas and oil burners may be extended many times by spraying aluminum on the heat exposed parts by the oxyacetylene metal spray process. A ferroaluminum oxide is formed which is highly resistant to heat corrosion. This also applies to grate bars, furnace parts, exhaust stacks, manifolds and piping. Aluminum sprayed in combustion chambers of internal combus-

Increased Cutter Speed Means Increased Production–

SUNOCO HELPS YOU SECURE BOTH!

THE ability of a milling cutter to remove metal is heightened by increasing its speed, with the feed per minute remaining unchanged.

Cutter speeds are limited, however, by the heat generated by the removing of the metal. The higher the speed, the higher the temperature. Sometimes this heat becomes sufficient to draw the temper or burn the cutting edges of the milling tool.

High Temperature Problem Overcome by Sunoco

The problem then is to dissipate this heat and as a practical solution we suggest Sunoco Emulsifying Cutting Oil.

A copious flow of Sunoco over a milling cutter carries away generated heat. It also minimizes the amount of heat generated. It gives cutters longer life per grind; does away with frequent cutter changes.

Cutters Won't Burn; Chips Won't Seize

Use Sunoco and your cutters will not burn, chips will not seize. The cuts will be clean and even. Flood the work with Sunoco and prevent the grinding action of the chips on the finished surfaces.

Sunoco improves quality, increases output — a trial under your own operating conditions will convince you.

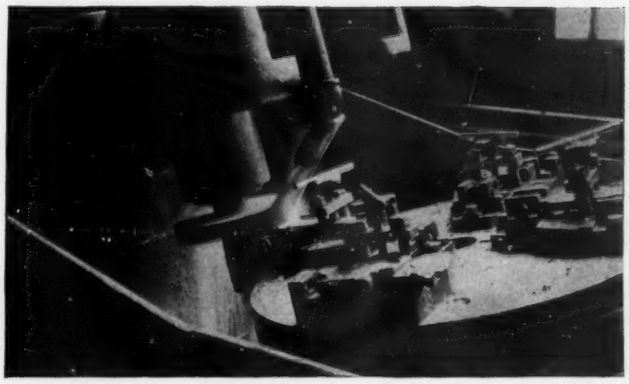
Operation: Milling bearing cap.
Machine: Oesterlein Heavy Duty Miller.
Material: Malleable iron.
Lubricant: 1 part Sunoco to 15 parts water.

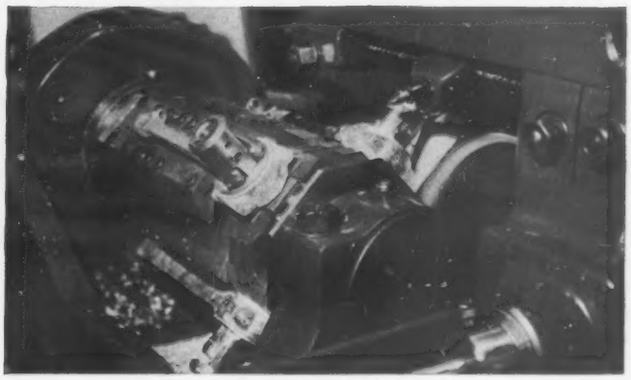
Courtesy of
Oesterlein Machine Co.
Cincinnati

SUNOCO
EMULSIFYING CUTTING OIL

Operation: Milling bolt bosses and sawing off cap on connecting rod.
Machine: 3-24 Cincinnati Hydromatic.
Material: Steel forging.
Lubricant: 1 part Sunoco to 20 parts water.

Courtesy of
Cincinnati Milling Machine Co.
Cincinnati





SUN OIL COMPANY **PHILADELPHIA, PA., U. S. A.** *Offices and Warehouses in more than 100 Cities*

Subsidiary Companies • Sun Oil Co., Ltd., Montreal, Toronto • British Sun Oil Co., Ltd., London, England

tion motors also eliminates spark knock, and by its high heat conductivity normalizes and reduces operating temperatures.

$ $ $

Three Pyrometers for Check

To provide an accurate check on the accuracy of the optical pyrometer, one large castings plant in the automotive industry has three instruments. One pyrometer is in daily use, the second is held in reserve in case something happens to the one in service and the third is kept in the laboratory and used only to check the service instrument weekly or oftener. In this way the management knows that 2800 degrees Fahr. iron this year has the same heat as 2800-degree iron next year.

$ $ $

Stengthening Malleable Iron

Nickel used occasionally in combination with molybdenum aids graphitization in malleable cast iron and increases strength and ductility. Chromium, formerly considered a deleterious element, now is used up to 1.25 per cent with an increase of silicon in making malleable fittings for the oil industry. Such castings have higher tensile strength, but marked lower elongation.

$ $ $

Develops Steels for Rams

Extrusion rams frequently have to bear stresses of over 110,000 pounds per square inch at temperatures high enough to make them glow. After considerable research and experience, an English steelmaker has decided that nickel-chromium and nickel-chromium-molybdenum steels are best for such exacting conditions. This company is now supplying these types of steels for rams, punches and liners.

$ $ $

Turbine Shaft Is Rebuilt

In building up a turbine shaft with 18-8 chrome nickel steel by metal spraying, a Minnesota company first revolved the shaft at about 40 revolutions per minute and, with a portable lathe, cut a rough chattery thread on the shaft. The metal then was sprayed on with a metallizing gun and the excess over the desired shaft size was removed by a portable polisher and grinder.

$ $ $

Chromium plated cooking utensils and other food containers are not affected by chemicals found in foods and drinking water. According to the Copper and Brass Research association, this has been established through research work at the University of Michigan.

$ $ $

Oxyacetylene flame cutting of high-carbon and most alloy steels, when accompanied by preheating and slow cooling has no effect on the physical properties. This may not apply for steels which have received special heat treatment.

Warns Industry of Early Shortage Of Technically Trained Men

BY 1938, when a young man entering college this coming fall would normally graduate, it seems clear that the accumulated deficiency in engineering graduates will more than equal the accumulated surplus of them during the preceding period of educational prosperity. The present is an unusually strategic time for young men of promise to enter engineering schools.

This opinion was expressed by Dr. Harvey N. Davis, president, Stevens Institute of Technology, Hoboken, N. J., when speaking May 31 over Station WOR on "Is Engineering Overcrowded?" This was the first of a series of talks ushering in the first "Choosing-a-Career" conference to be held June 26-28, at L. Bamberger & Co., Newark, N. J.

In stating that next fall will be an opportune time for young men to enter engineering schools, Doctor Davis recalled that over a year ago, "Dr. James A. Farrell, then just retiring from the presidency of the United States Steel Corp., said to a group of friends that he had no question but that American industry would soon find itself facing the worst shortage of technically trained men it had ever known. He said that this would be true at all occupational levels from machinists and other skilled workmen to research men with doctor's degrees.

"As a proof of this, he said that such a shortage had appeared after every previous depression in industrial history, and that, to the extent that this depression has been severer than usual, the ensuing shortage of technically trained men will be severer than has been experienced previously.

"At the time, that statement seemed to an engineering educator altogether too good to be true. But as the months have rolled by and I have watched events with that statement vividly in mind, I have become convinced that it is sober fact. Already on the skilled trade level, acute isolated shortages are beginning to appear. For example, all through last summer it was said to be almost impossible to hire a skilled steam-shovel operator, that being, I am told, one of the hardest of the skilled trades to become really adept at. For months now, good tool and die makers have been at a premium, and I am told that in some industrial areas coppersmiths of certain special kinds have been hard to find. The trouble is, of course, that in these special fields, many older workmen have drifted into other work, or have lost both their knack and their morale through enforced idleness and advancing years; and at the same time the normal recruiting of new blood through apprenticeships and industrial training has practically ceased.

Gradual Shortage of Engineers

"On the college graduate level of technically trained men things will undoubtedly work out rather differently in detail. We shall have no similar acute little shortages in isolated specialties here and there, for one of the essential differences between college trained men and skilled artisans is the greatly superior versatility and adaptiveness which a broad engineering training produces. If there is a special demand for any particular kind of engineer, there are always plenty of men in a wide variety of related specialties who can become competent in the desired field almost over night. Among college trained technical men the impending general shortage will come, not as a succession of acute shortages in specialties, but rather as a gradual and largely unperceived reabsorption into industry of the whole floating supply of men of a given age and experience level. The change from a buyer's to a seller's market for engineering services is likely to come rather suddenly, and perhaps unexpectedly, when it comes.

"And yet, already, occasional straws are showing which way the wind is blowing. Our alumni secretary recently told me that he is suddenly beginning to have real trouble in finding enough keen young graduates with four or five years of actual business experience behind them to match the opportunities that are coming to his desk. More and more I am convinced that Dr. Farrell was right when he said, 15 months ago, that American industry is soon going to have to face a severe shortage of technically trained men."

ARE YOU STARTING RIGHT?

At every step we ask:

"Which *method* will make the *best* TOOL STEEL?"

AT every stage in the manufacture of Bethlehem Tool Steels there's just one basis for determining the process to be followed. The answer to the question, *"Which method will make the best tool steel?"* solely decides the equipment and method that we use.

This policy has led to adoption of the following processes, which are outstanding features of practice in the Bethlehem Tool Steel Plant:

HIGH-FREQUENCY right start by melting steel to laboratory

INDUCTION MELTING: Bethlehem Tool Steels get the in the high-frequency electric induction furnace, which makes standards of accuracy.

LIBERAL INGOT **DISCARD:** Large discards, from both the top and bottom of the ingot, mean that the buyer gets only the "cream" of the tool steel.

HAMMER-COGGING OF INGOTS: It's far costlier to hammer-cog ingots than to roll them. But the tremendous impact developed under the 14,000-lb. hammer insures a complete working of the entire ingot and the breaking up of all undesirable ingot structure.

PROGRAM-CONTROLLED ANNEALING: and cooling curve desired is obtained by a a plate guides the temperature regulator.

The exact heating, soaking motor-driven cylinder on which the edge of Possibilities of human error are eliminated.

RIGOROUS INSPECTION: Thoroughly representative cross-sections for inspection are obtained by cutting slabs from the tool-steel billet stock before rolling, and cutting discs from the finished bars . . . These samples are subjected to hot-acid etch, hardenability tests and microscopic examination.

Bethlehem Steel Company, General Offices: Bethlehem, Pa.

BETHLEHEM TOOL STEELS

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Many Companies Exhibit in Purchasing Agents' Show

PRODUCERS, fabricators and jobbers of iron and steel and nonferrous metals and their products were well represented in the 1934 Inform-a-show, or annual exposition, held in Hotel Cleveland, Cleveland, June 18-21, in conjunction with the nineteenth annual international convention of the National Association of Purchasing Agents. Also included in the 50 exhibits were displays of packaging equipment, scales, fiber materials, lubricants, electric lights and other specialties. The show was unusually well attended during its four days.

Among the steel producers exhibiting was the American Steel & Wire Co., Chicago, which demonstrated the art of wire making. A wire drawing machine was in operation producing fine low-carbon steel wire. Various types of wire and wire products were available for inspection and by means of illuminated transparents other products of the company were illustrated.

Products Are Displayed

Jones & Laughlin Steel Corp., Pittsburgh, exhibited an unusually wide range of steel products, including cold rolled steel, bessemer screw steel, shafting, flats, wire, nails, staples, bars and shapes, tin plate, tubes, pipe, structural shapes and other items. An attractive background was provided by illuminated panels in which open-hearth and bessemer steelmaking operations were simulated mechanically.

Welded and seamless wrought tubular steel products, stainless and heat-resisting pipe and tubes, boiler and condenser tubes, all in a wide range of sizes and sections, constituted the exhibit of the National Tube Co., Pittsburgh. Products shown by the Pittsburgh Steel Co., Pittsburgh, included chain-link fence, huge-joint and stiff-stay fence, nails, wire, reinforcing fabric, pipe and tubes. A mechanical background added attractiveness to this booth.

Three working models of mill equipment drew interest to the exhibit of the Youngstown Sheet & Tube Co., Youngstown, O. One model simulated the rolling of wide steel sheets on a two-high automatic mill; another demonstrated the operation of a butt-weld tube mill. Small diameter wire was drawn on a small drawing block. Colored transparents of steelmaking operations formed the background.

Bissett Steel Co., Cleveland, displayed a wide range of steels for industry, welding rods, tungsten carbide and tantalum carbide tools and drawing dies for wire, rod and tubing. A wide assortment of cap and set screws, machine and carriage bolts, nuts, and related products made up the exhibit of the Cleveland Cap Screw Co., Cleveland. Mounted on display boards and in cases, the National Screw & Mfg. Co., Cleveland, showed all types of cold upset and threaded products, including bolts, screws, nuts, rivets, cotter pins, tacks, and the like.

Featured in the booth of the Raymond Mfg. Co., Corry, Pa., were hundreds of coil springs, flat springs, wire forms, and small stampings produced from steel and nonferrous metals and alloys.

Equipment for fastening and sealing packages with steel strapping constituted the exhibits of the Acme Steel Co., Chicago, and Signode Steel Strapping Co., Chicago. The former demonstrated the steelstrap system of reinforcing boxes, crates, bundles and bales with tensioned steel bands, sealed and applied without nails. The latter showed the use of its tensional steel strapping, pail clasps, tag fasteners and lithographed seals.

Alloy Castings Shown

Allyne-Ryan Foundry Co., Cleveland, displayed in its space a wide variety of gray iron and semisteel castings. Included were a number made from the company's high-strength, dense alloy which possesses good machining qualities. Grinnell Co., Providence, R. I., exhibited cast iron and malleable pipe fittings and unit heaters. Large and small castings made from gray iron and steel comprised the display of the Superior Foundry Co., Cleveland.

Valves, boiler mountings, lubricators, oil and grease cups, made from cast iron and nonferrous metals were included in the products of the Lukenheimer Co., Cincinnati. Walworth Co., South Boston, Mass., exhibited cast iron and nonferrous valves and fittings, also pipe wrenches.

Industrial lubricants and various petroleum products made up the exhibit of the Standard Oil Co. of Ohio, Cleveland. D. A. Stuart & Co. Ltd., Chicago, showed oil products for machining and drawing stainless and alloy steels, lubricating oils and greases.

Chicago Belting Co., Chicago, exhibited leather belting and hydraulic packing for a wide variety of applications. Tension cemented leather belting ocmprised the display of Graton & Knight Co., Worcester, Mass. Belt lacers, belt hooks, belt cutters, card and pin cutters and connecting pins, were demonstrated by the Clipper Belt Lacer Co., Grand Rapids, Mich.

In the exhibit of the General Electric Co., Schenectady, N. Y., mazda lamps were demonstrated by the Electrical Testing Laboratories, an independent testing organization employed by the company. Fiber pipe and fittings and a new plastic synthetic resin material, having acid-resisting characteristics and being suitable for pickling tanks and acid containers, were shown by the Continental Diamond Fibre Co., Newark, Del. Pittsburgh Coal Co., Pittsburgh, showed samples of steam, by-product and industrial coals and through use of moving pictures described how they are mined and prepared.

Feature Nonferrous Materials

Three companies exhibited brass, copper, bronze and other nonferrous alloys and products made from them. American Brass Co., Waterbury, Conn., displayed electro sheet copper, beryllium copper, brass, bronze and copper alloys. Chase Brass & Copper Co., Waterbury, Conn., showed sheet, rod, wire and tubing of brass, copper, bronze and nickel silver. Scovill Mfg. Co., Waterbury, Conn., featured brass and nickel-silver sheets, rod and wire, brass tubing and pipe, copper tubing, cap and machine screws.

Several types of scales were demonstrated by the Toledo Scale Co., Toledo, O. Among them were a parcel post scale, packaging machines, and a vibrator conveyor packaging machine equipped with an electric eye. Charts, graphs and statistics showing the range of supplies in stock in mill supply houses were displayed by the joint merchandising committee of the mill supply industry.

Enameled Steel Units for Gas Station Prefabricated

Prefabrication of materials at the Cleveland plant of the Austin Co. facilitated erection of the new porcelain-enameled steel automobile service station built for the Emblem Oil Co. at Fredonia, N. Y., within 10 days after the foundations were installed. A distinctive design developed to include the oil company's trademark as a central motif will be followed in other stations, although building size will be varied to suit location requirements. The trade mark and lettering are stenciled on the porcelain enamel panels before firing so that they are an integral part of the building itself.

PROGRESS IN STEELMAKING

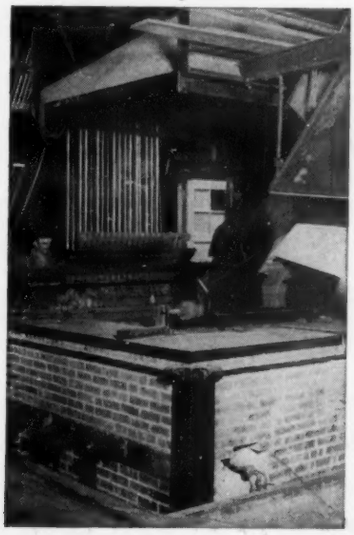
HEAT resistant aluminum paint for refractories which is claimed to withstand in excess of 1500 degrees Fahr. without fading is of recent development. The product may be used for large brick surfaces and linings.

♦ ♦ ♦

Interest is being attached to an Ohio river blast furnace which recently was relined and given a new foundation. Several months ago the stoves and the stack itself began to tilt at a precarious angle and after some survey, a delicate job of reinforcing the foundation to the furnace was engineered. The stack also was relined and the stoves equipped with a new kind of checkerwork. Although the stack itself is again on a perpendicular keel, the stoves have not been changed and still have a list. Whether this will have an effect on the furnace's operation is awaited.

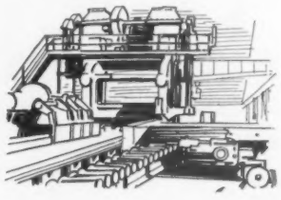
♦ ♦ ♦

Steels of high physical value and high furnace yield are claimed to result from the use of a new deoxidizer recently developed for soft heats such as auto and deep drawing stock which finish about 0.06 per cent carbon.



♦ ♦ ♦

Economic construction and maintenance are features of a newly devised pickling tank. The base, which may be built of steel rails, I-beams or other structural shapes, supports angles upon which rests numerous structural cross members. Sidewall frames are welded or bolted to the bottom and top angles. Sheet lead is supported at the bottom by the channel cross members and is brought up the sides and over the top of the framework.



DEPOSITION of dust, dirt and mill scale on blooming mill screws at many Czechoslovakian plants is prevented by a telescopic boot installed between the upper roll bearing and nut, according to a rolling mill authority.

♦ ♦ ♦

Important factors bearing on the control of the grain size of steel and said to constitute 85 per cent of the problem of grain size control include the percentage of FeO in the bath of slag, control of temperatures and addition of aluminum to the bath. Some producers now are able to obtain with ease either fine, or coarse grained steel but have not perfected the control of grain size sufficiently to be able at will to get desired grain sizes between coarse and fine.

♦ ♦ ♦

Magnet steel developed in Japan is stated to have nine times greater magnetic activity than that of tungsten magnet steels and two and one

half times that of cobalt steels. The new material, which requires only annealing to develop its best magnetic activity, is an alloy of iron, nickel and aluminum, suitable for casting but not readily forged. Temperature changes and vibration are claimed to have no affect on the metal.

♦ ♦ ♦

For every 100 tons of zinc used for coating wire, according to tests made abroad, about 68 per cent goes in the coating, about 18 per cent forms dross containing approximately 91 per cent of zinc, about 12 per cent goes to form ashes containing from 66 to 68 per cent of zinc and about 2 per cent is lost by volatilization, burning, handling, etc.

♦ ♦ ♦

Improving the quality of steel plates and reducing the amount of rejects have been effected by a platemaker by installing an annealing furnace between a combination roughing and finishing 3-high sheared plate mill and the roller leveling machine. After the plate is rolled to specified gage it is charged into the annealing furnace. As it passes the charging door it intercepts a beam of light from a photoelectric tube which causes a relay to complete a circuit to a pen of a recording instrument. The pen makes a line near the top margin of the chart, conforming to the time required for the work to pass the light beam. Upon leaving the furnace the plate intercepts another beam of light which performs the same operations as previously mentioned, except for making a line on the bottom margin of the chart. The chart also indicates the rate of travel. An automatic pyrometer for recording the temperature at which the steel was heated also is provided.

BILLETEER REVOLUTIONIZES CHIPPING

Speed your billets through a BONNOT-LENTZ Billeteer.

This self-contained unit performs with splendid efficiency on all alloy and carbon steels now chipped by air methods.

The more serious the defects—the greater the savings. *Off-heats* — which may not be chipped by hand because of prohibitive costs—can *now* be salvaged on a Billeteer *at a huge saving.*

Three years of successful commercial performance have proven both dependability and investment value.

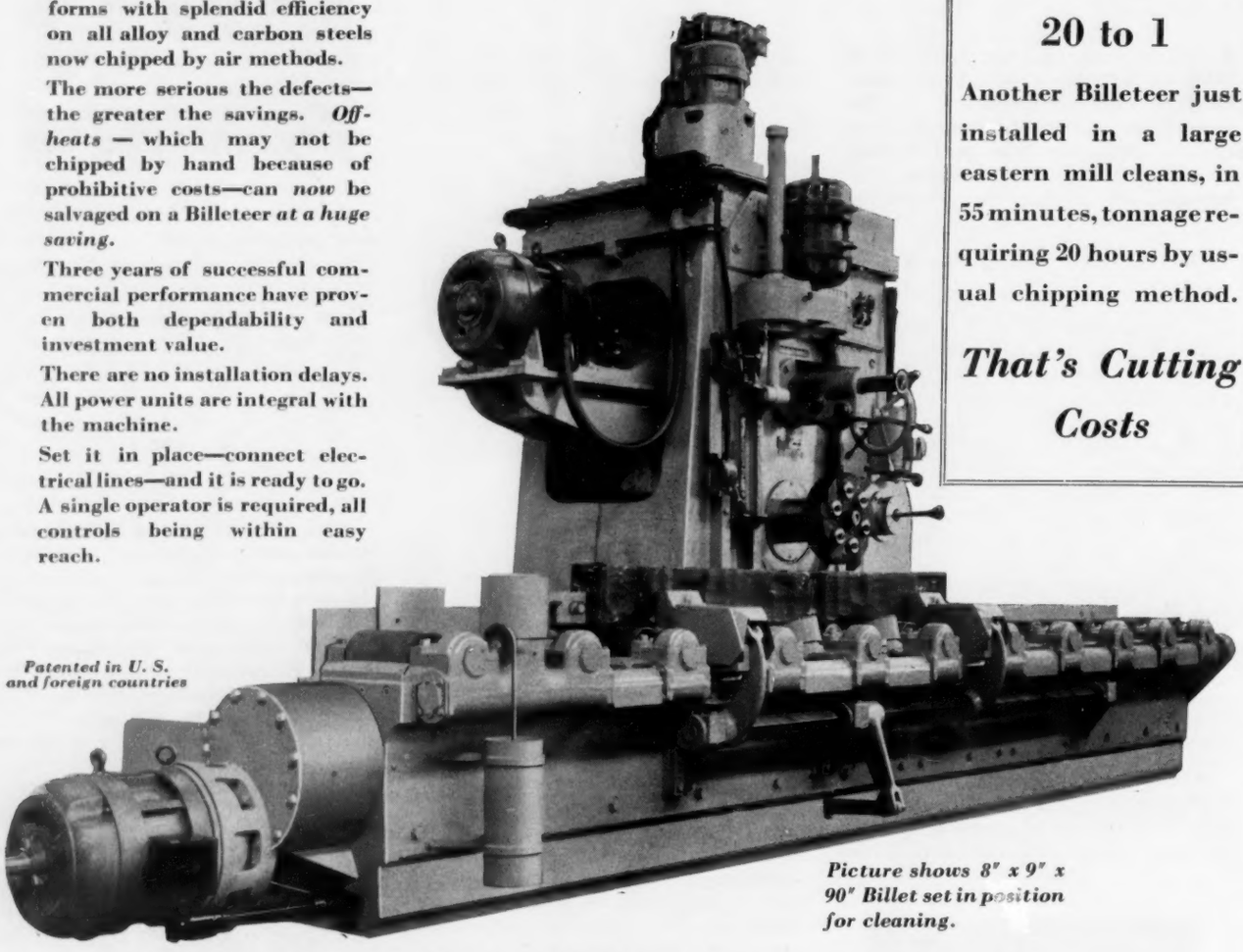
There are no installation delays. All power units are integral with the machine.

Set it in place—connect electrical lines—and it is ready to go. A single operator is required, all controls being within easy reach.

20 to 1

Another Billeteer just installed in a large eastern mill cleans, in 55 minutes, tonnage requiring 20 hours by usual chipping method.

That's Cutting Costs



Patented in U. S. and foreign countries

Picture shows 8" x 9" x 90" Billet set in position for cleaning.

THE COST of cleaning billets with this proven machine is far below any other known method — so far in fact that it's *cheaper to own a Billeteer than to be without it.*

Highest Capacity - Minimum Waste - Unified Controls
Powerful - Flexible - Rugged

Steel Equipment Division

THE BONNOT CO.
CANTON, OHIO

PRODUCING HIGH-SPEED STEEL IN THE CORELESS INDUCTION FURNACE

BY PETER BARDENHEUER AND WERNER BOTTENBERG

Part II

Translated from "Transactions of the Kaiser-Wilhelm Institute," Dusseldorf, Germany Vol. XIV, No. 7

BY WILLIAM ADAM JR.
Ajax Electric Co. Inc., Philadelphia

(*Continued from May 28 issue*)

CAST bars were worked in the usual manner. After pulling from the molds, the bars were heated to 860 to 880 degrees Cent. in about 9 hours, held at that temperature for 8 hours and then slowly cooled (48 degrees Cent. per hour) to 400 degrees Cent. and finally cooled in the furnace. The bars then were turned in a lathe; Table III shows the percentage of metal removed. In view of the low-pouring temperatures, this metal loss is low except for one or two cases.

The turned bars were sent to the forge shop and forged under a steam hammer. They were heated to 1200 degrees Cent. within 15 hours. They were drawn at this temperature and forged to rods, 0.59 x 1.57 inches, after several heatings. The degree of deformation was about 95 per cent, and the forging temperature averaged about 940 degrees Cent.

The bars then were annealed at 840 degrees Cent. and cooled in a bed of ashes. One piece about 15.75 inches long from each heat was set aside for further investigation.

Standard Practice Followed

The usual hardening practice for high-speed steel lathe tools was used, namely, slow preheating to about 625 degrees Cent., then transferred to a previously heated furnace at 1300 to 1320 degrees Cent. and finally cooled in an air stream or quenched in oil, or molten salt. In this case, the tools were quenched in oil until totally cooled.

F. W. Taylor[8] already has referred to the good results obtained from a subsequent tempering operation. C. A. Edwards and H. Kikkawa[9] studied these conditions in more detail and showed that an appreciable increase in hardness is obtained in a steel of given analysis by drawing to about 560 to 580 degrees Cent. which is attributed to the resulting polyhedron martensite structure. This again was confirmed in this investigation. The tempering, which directly followed the hardening, was done in a lead bath at 560 degrees Cent. for 15 minutes; the tools being heated slowly with the lead bath. They were then cooled in still air. Table IV shows the Rockwell and brinell hardness of the individual steels in the annealed, hardened and tempered states. The values given represent an average of three closely approximate single values. The increase in hardness due to tempering is evident.

The lathe tools finally were finished on a soft emery wheel with copious water cooling. Their final shape is reported in detail later.

The fractures of pieces hardened under like conditions showed a fine grain having somewhat of a satin-like appearance in all cases.

Structure Investigation

A metallographic examination was made for cleanliness of the steel, i.e., nonmetallic inclusions such as slag inclusions, oxides and sulphides. No slag inclusions could be detected in the unetched sections when magnified 500 diameters. Finely divided precipitation products due to the thorough deoxidation as well as the absence of sulphur were hard to find. The steels melted in an acid lining showed an extremely high degree of purity. The absence of slag inclusions is attributed to the fact that toward the end of the melt when the bath had attained a sufficiently high temperature, the power applied was reduced for 15 or 20 minutes, and the current disconnected altogether for about 5 minutes before pouring. For each installation, experience will indicate the minimum generator load to hold the temperature practically constant and reduce the bath circulation. The opinion often held that the bath circulation in the high-frequency furnace must result in slag inclusions in the metal is erroneous; it is only true in case the melting is carried through to the end with full generator load and no time is allowed for the bath to remain quiescent.

The structure of the ingots showed a fine network which probably is affiliated with the low casting temper-

Table III

Metal Removed from Cast Bars

Steel no.	Wt. of Bar—pounds Raw	Machined	Loss in %
1	507	485	4.4
2	507	492	3.1
3	507	489	3.5
4	606	540	10.9
5	441	401	9.0
6	496	448	9.8
7	474	459	3.3
8a	430	403	6.2
9	478	441	7.8
10	463	430	7.1
11	419	403	3.7
12	437	419	4.0

Table IV

Hardness of Steels Melted

Steel no.	Rockwell Hardness "C" Scale Annealed in furnace at 850° Cent.	Hardened in oil at 1300° Cent.	Tempered in lead at 560° Cent.	Brinell Hardness 10/3000/30 Annealed in furnace at 850° Cent.	Hardened in oil at 1300° Cent.	Tempered in lead at 560° Cent.
1	32.1	63.7	67.1	302	710	740
2	30.9	62.8	65.4	296	608	738
3	30.0	61.5	65.3	286	652	696
4	23.9	64.3	65.9	239	578	674
5	29.5	63.0	66.8	285	634	723
6	26.0	61.6	65.8	253	642	695
7	28.0	58.1	64.0	255	617	716
8a	26.1	61.0	66.9	258	618	682
9	29.6	65.0	67.0	267	627	708
10	26.4	60.6	65.9	241	578	665
11	29.8	62.8	66.3	239	611	684
12	31.5	62.4	64.9	276	661	719

[8]F. W. Taylor: On the art of cutting metals. Trans. A. S. M. E. Vol. 28, 1906.

[9]C. A. Edward and H. Kikkawa: The Effect of Chromium and Tungsten Upon the Hardening and Tempering of High Speed Tool Steel. J. Iron Steel Inst. 92 (1915).

atures. Accordingly, the hardened steels also possessed a comparatively fine granular polyhedral structure with imbedded carbides finely dispersed. Although there may be a difference of opinion whether small or large polyhedrons are best, there can be no question regarding the significance of the size and distribution of the imbedded double carbides.

Two Heats Are Selected

Figs. 1 to 12 are photomicrographs of the steels in Heats 4 and 5. For each steel there is a picture of the annealed transverse section, of the hardened samples in the lengthwise section; middle and edge, in transverse section; middle, intermediate and edge. These two heats were selected because they were melted with the two methods which subsequent investigation showed to be the best. However, it should be noted that the structure of the steels from the other heats showed no appreciable difference from these.

The fine formation and even distribution of the hard and brittle double carbides, which largely are dependent on the solidification conditions and the forging, are especially advantageous for the subsequent working and particularly for the cutting capacity compared with a coarse formation of these carbides or locally concentrated carbides.

In an endeavor to keep the production cost of a product as low as possible, considerable effort has been made to perfect the cutting tools for machines. An exact knowledge of the working properties of tool steels is highly important to the practical operator. Remaking a tool, hardening, grinding, etc., involves increased labor costs in addition to the material cost. The numerical values easily determined for mechanical properties, as well as the analysis and structure, give valuable indications but not sufficient information on the value of the tool. Therefore, it is not surprising that an operating test is resorted to for judging a high-speed steel tool, and that the cutting capacity means more to the practical operator than the results of chemical, metallographic and mechanical examinations.

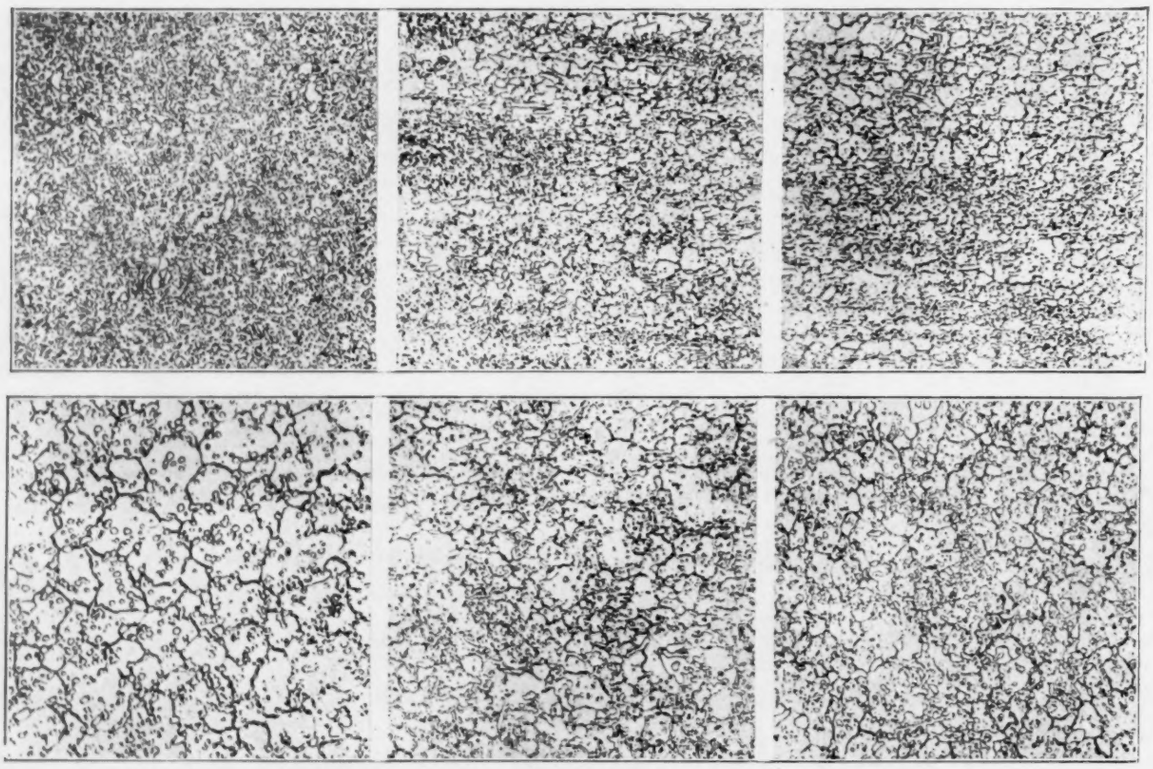
Application Should Be Known

In judging a high-speed steel tool, the kind of work it is used for must be considered. Experience teaches that the behavior of tools of different types, made of the same material, will vary greatly. A roughing lathe tool, for example, may give good results. A forming tool less satisfaction and a twist drill, made of the same material might fail entirely. Consequently, a turning test cannot be used to judge the suitability of a steel for making drilling and milling tools. The turning test was used in this investigation to examine the mechanical properties primarily because this cutting method is of the greatest general interest and the simplest and least expensive test.

Cutting Capacity Utilized

It is self evident that a number of factors, such as the method of cooling the ingot, the thermal and mechanical treatment, the forging, hardening and grinding have an influence on the cutting capacity of the steels. In spite of this, the cutting capacity was utilized to determine the manufacturing method because no other useable testing method was available. This was feasible because the preliminary treatments of the test steels were kept as nearly alike as possible in all cases, and further because irreproachable data could be expected for valuing the melting method from the great number of individual tests made under the same conditions.

Although the turning test generally is used to determine the cutting capacity of a steel, the testing conditions never have been standardized. In this case, an attempt was made with simple means and without special experimental apparatus to obtain comparative values regarding the turning time until the tool became blunt. A 15.75-inch lathe was available with means for a wide range of speeds. The working condi-



Heat No.4. X500

Fig. 1—Transverse section, annealed
Fig. 2—Middle of lengthwise section, hardened
Fig. 3—Edge of lengthwise section, hardened
Fig. 4—Middle of transverse section, hardened
Fig. 5—Intermediate of transverse section, hardened
Fig. 6—Edge of transverse section, hardened

Medium Carbon Ferromanganese

SIMPLIFIES PRODUCTION of Low Carbon Steel

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THE solutions to some of the most serious problems in the production of low carbon steels are offered through the adaptation of Medium Carbon Ferromanganese to your practice. With the use of Medium Carbon Ferromanganese it is not necessary to reduce the carbon in the bath to the extent required when higher carbon alloys are used. Oxidation of the bath, therefore, is much less severe. With less oxidation considerable savings in time and material required for deoxidation are obtained. Since refractory costs increase rapidly as the carbon in the bath is lowered the lower carbon in this alloy permits a higher carbon content when tapping and substantially reduces refractory costs.

Medium Carbon Ferromanganese was developed to meet specific needs in low carbon steel production. It fulfills those needs and our engineers want to show you how your practices will profit by its use.

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CHROMIUM
High Carbon Ferrochrome (maximum 6% carbon)
Low-Carbon Ferrochrome (in grades, maximum 0.06% to maximum 2.00% carbon)
Chromium Metal
Chromium-Copper
Miscellaneous Chromium Alloys

SILICON
Ferrosilicon 15% Ferrosilicon 50%
Ferrosilicon 75%
Ferrosilicon 80 to 85%
Ferrosilicon 90 to 95%
Refined Silicon (minimum 97% Silicon)
Calcium Silicon
Calcium-Aluminum-Silicon
Calcium-Manganese-Silicon
Silicon-Copper
Miscellaneous Silicon Alloys

BRIQUETS
(Patented)
Chrome Briquets Silicon Briquets
Manganese Briquets

TUNGSTEN

MANGANESE
Standard Ferromanganese 78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Manganese Metal
Manganese-Copper
Miscellaneous Manganese Alloys

SILICO-MANGANESE
All grades including Silico-Spiegel

VANADIUM
All Grades

ZIRCONIUM
Aluminum-Zirconium 35 to 40% Zirconium
12 to 15% Zirconium
Zirconium-Manganese-Silicon

Table V

Chemical Composition of Steels from Outside Sources

Steel no.	C %	Si %	Mn %	P %	S %	Cr %	W %	V %	Mo %	Ni %
13	0.69	0.25	0.21	0.018	0.016	4.42	18.40	1.24	0.35	0.26
14	0.80	0.35	0.27	0.018	0.042	4.45	20.50	0.96	0.26	Trace
15	0.69	0.28	0.22	0.022	0.018	4.65	18.40	1.31	0.71	0.16
16	0.79	0.31	0.43	0.011	Trace	3.84	18.70	0.79	0.16	0.35
17	0.74	0.31	0.35	0.010	0.005	4.25	17.86	0.59	0.78	0.22
18	0.73	0.24	0.32	0.014	Trace	4.15	18.37	0.60	0.75	0.27
19	0.80	0.31	0.37	0.014	Trace	4.06	18.70	0.82	0.24	0.30
20	0.77	0.21	0.35	0.015	Trace	4.12	19.71	0.84	0.33	0.22
21	0.77	0.33	0.37	0.011	Trace	3.69	18.24	0.69	0.26	0.31
22	0.85	0.30	0.46	0.025	0.021	5.05	19.00	1.40	0.58	0.10
23	0.70	0.13	0.03	0.018	0.038	4.99	18.10	0.57	0.74	0.10
24	0.69	0.30	0.20	0.007	0.014	4.90	18.10	1.21	0.13	....
25	0.74	0.35	0.33	0.024	0.008	4.87	19.30	1.02	0.62	Trace
26	0.74	0.36	0.25	0.017	0.016	4.15	17.80	0.69	0.26	0.10
27	0.73	0.16	0.28	0.024	0.035	4.75	19.00	0.45	0.31	0.26
28	0.76	0.27	0.39	0.026	0.018	4.45	18.10	1.85	0.53	0.24

tions, for all cases, were as follows: 0.118-inch depth of cut, 0.39-inch feed and 0.866-inch per minute cutting speeds. This speed was constantly checked by a clock of the recording type.

For machining, we used a 19.69-inch diameter shaft of normalized silicon manganese steel having the following chemical and mechanical values: 0.52 per cent carbon, 0.78 silicon, 1.25 manganese, 0.022 phosphorus, 0.026 sulphur, 248 brinell hardness and 125,578 pounds per square inch. The tools were not cooled. The usual lip angles for machinery steels of 99,562 to 127,008 pounds per square inch tensile were retained.

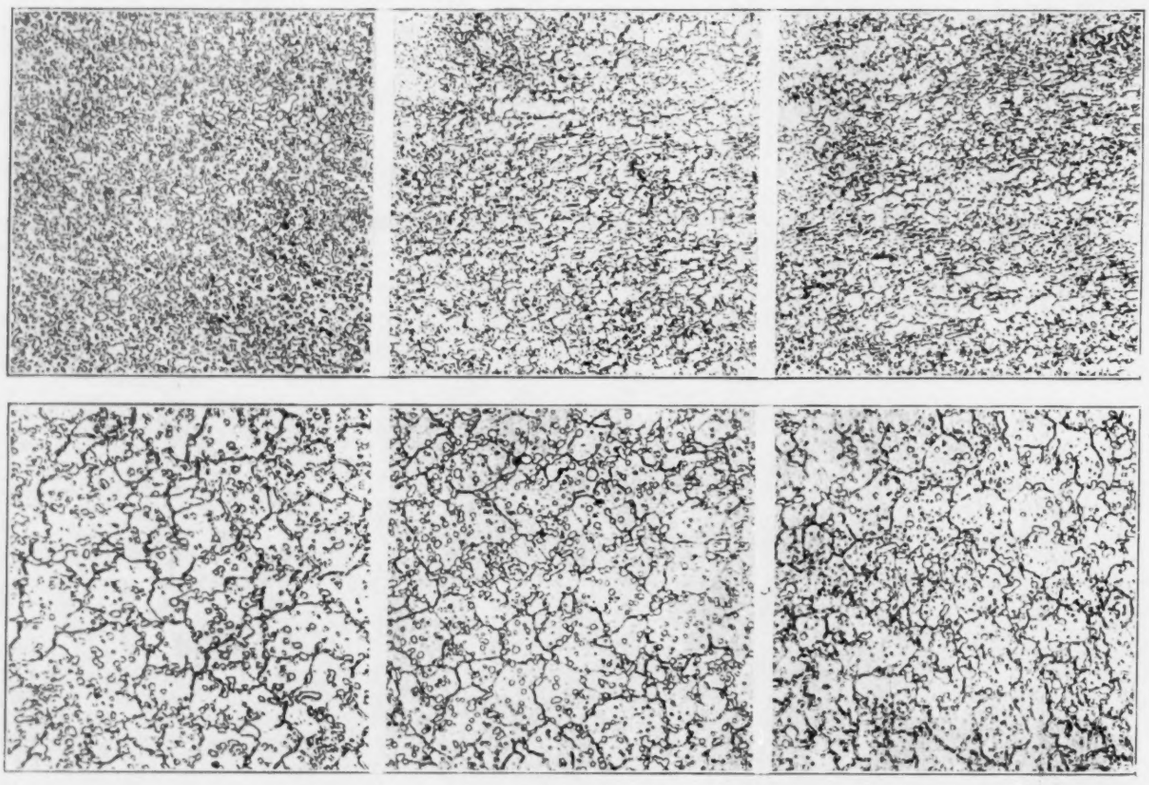
During the tests the time was measured during which the steel held its cut. The moment the tool became blunt could be determined fairly accurately on the polished brake of the shaft.

Machining Time Measured

In order to have a basis to judge the cutting capacity of our own steels, various steels shown in Table V were given identical tests on the same shaft. These foreign steels were heat treated in accordance with the instructions furnished by the manufacturers of the metal.

Four cutting capacity tests were made with each foreign and own steel directly after each other. After each test the tool was reground but not rehardened. The average value for each steel was determined from three individual values, excluding the peak value.

In view of the exacting testing conditions, naturaly no high cutting values specifically measured were expected. However, the values were within normal limits throughout. The average cutting time obtained from the foreign steels ranged from 3 to 18 minutes (average 9.3 minutes),



Heat No. 5. *X*500

Fig. 7—Transverse section, annealed
Fig. 8—Middle of lengthwise section, hardened
Fig. 9—Edge of lengthwise section, hardened
Fig. 10—Middle of transverse section, hardened
Fig. 11—Intermediate of transverse section, hardened
Fig. 12—Edge of transverse section, hardened

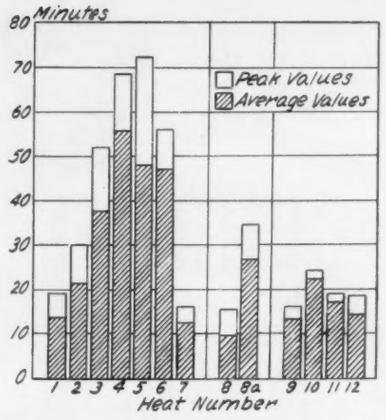


Fig. 13—Cutting capacity of high-speed steels melted

and the peak values from 3.5 to 26 minutes (average 11.2 minutes). Results of the cutting tests with our own steels and steel No. 8 from the arc furnace are given in Fig. 13.

Steel from Heat No. 1, made by remelting high-speed scrap, showed a cutting capacity equal to a good arc furnace steel. Somewhat better values were obtained by melting unalloyed steel with subsequent alloy additions (Steel 2). With the same operating methods, the use of pure raw materials apparently offers no advantage (Steel 7). Considerably better results were obtained from those heats in which the unalloyed steel and alloying ingredients were melted together, see Nos. 3 and 4. Equally good results were obtained in 5 and 6—the duplex process in which the finished carbon steel from the basic arc furnace was charged and subsequently alloyed. The cutting tests with Steels 8 and 8a clearly show that the transfer of high-speed steel, made in a basic arc furnace to the acid high-frequency furnace noticeably improves the cutting capacity.

Basic steels do not approach the cutting capacity of acid steels, despite the fact the same care was used in melting both. Regardless of the melting method used, they produced cutting capacities in no way inferior to the good heats from the basic arc furnace. By far the best results were obtained from the steels melted in an acid lining, heats 3 to 6. Accordingly, the operating methods used in these heats are of special significance for melting high-speed steel.

The tests were made with comparatively low alloyed steels. By increasing the important alloying elements, it is expected that the capacity would be increased. The influence of tungsten is shown in Fig. 14 and of vanadium in Fig. 15, according to W. Oertel and A. Gruetzner[3]. So far as can be ascertained from these tests, the cutting life is much more influenced by the melting method than by the chemical composition.

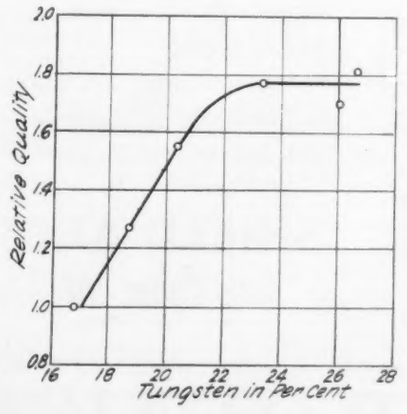


Fig. 14—Effect of tungsten on the cutting capacity

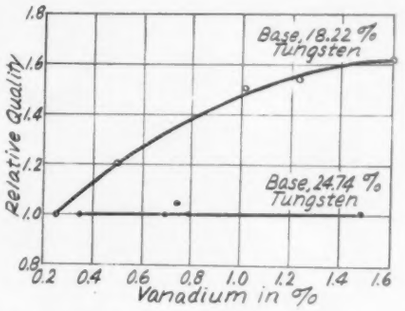


Fig. 15—Effect of vanadium on the cutting capacity

(*To be continued*)

British Founders Discuss Research

(*Concluded from Page* 33)

been real theoretical reasons to support the idea of a dangerous range of phosphorus. There have been numerous examples of good castings obtained with quite a medium phosphorus content, but the carbon content must be below the eutectic value. In low-sicilon irons, phosphorus can be increased without danger of porosity. Certain rules or formulas, such as silicon plus phosphorus should not exceed 2.5 per cent, can be useful.

John Shaw pointed out that in Great Britain there is a predominance of high-phosphorus iron; the subcommittee might, therefore, investigate how medium phosphorus irons can be used for making sound castings. He said carbon content can easily be brought down to 3 per cent in the cupola.

F. J. Cook, referring to a mention made in the report to a past work of which he was the author, said he had never been dogmatic about the phosphorus danger zone, but he has seen many cases tending to confirm its existence. J. W. Bolton, in America, has shown that there is a distinct change in the iron when the phosphorus content passes the 0.5 per cent point. He thought, however, that what matters mostly is the total carbon; if total carbon is even just below the eutectic point, phosphorus is not detrimental; he had proof of this in making diesel engine pistons with as much as 1.4 per cent phosphorus, without any breakdown.

The exchange paper of the Verein Deutscher Eisengiessereien of Germany was presented by its author, Dr. Ing. Heinrich Nipper of the Technical high school of Aachen, who gave a message of greeting on behalf of the German association. Title of the paper was: "Contribution to the Study of Graphite Formation and Structure in Cast Iron and Its Influence Upon the Properties of the Cast Metal."

Structure Bears on Strength

J. G. Pearce said we now know that strength in cast iron is not altogether due to its composition, but it is also a question of structure. Referring to supercooling effects mentioned in the paper, he said that when an iron is superheated, the tendency to supercool increases; this supercooling action, under certain circumstances, gives the fine graphite flakes shown in the microstructures. This extremely fine graphite generally is an unfavorable factor. He pointed out that inoculation originated with the desire to remedy these effects of supercooling; in Germany, inoculation seems to have opposite results to those obtaining in Great Britain, but investigations on both sides seem to converge toward an interesting truth.

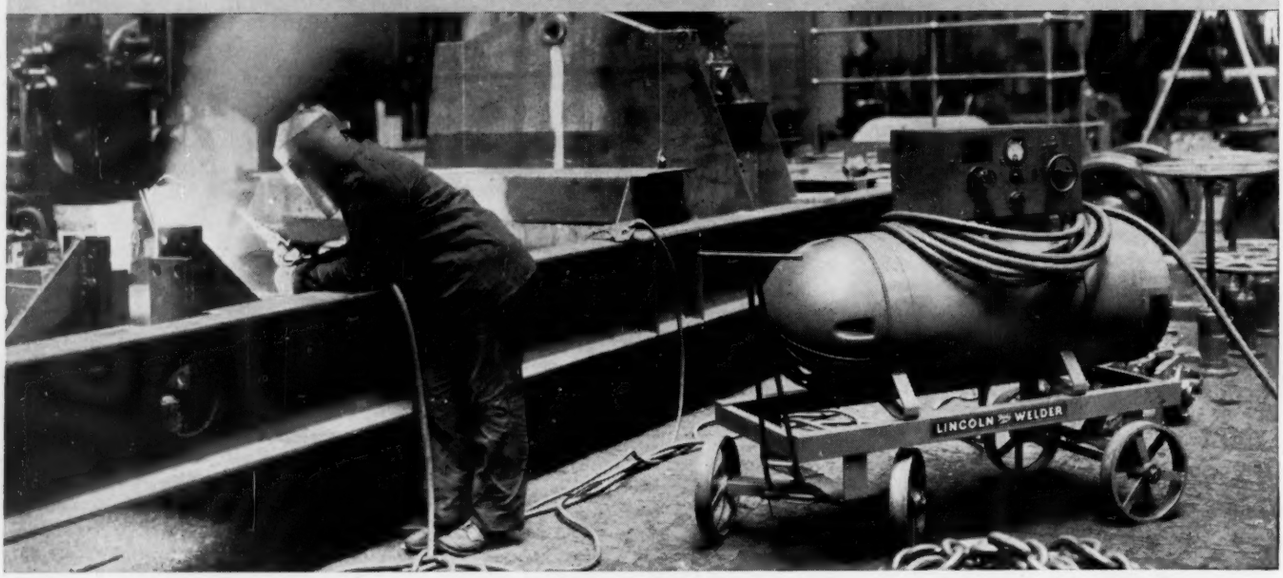
The American exchange paper was presented before the nonferrous section, which was presided over by J. E. Hurst, senior vice-president. Author of the paper was C. M. Saeger Jr., physicist, national bureau of standards, Washington, the title being: "Studies on Cast Red Brass for the Establishment of a Basic Classification of Nonferrous Ingot Metals for Specification Purposes." The paper was presented in abstract by Vincent Delport, European representative of the American Foundrymen's association and European manager of STEEL.

Other papers presented were: "Oven Drying of Cores and Molds," by E. G. Fiegehen, Longuevil, Province of Quebec, Canada; "Recent Developments in British Synthetic Molding," by John J. Sheehan, Austin Motor Co. Ltd., Birmingham; and the French exchange paper: "In the Use of High-Duty Cast Iron in the Manufacture of Textile Machinery," by A. Roeder, chief chemist, Societe Alsacienne de Constructions Mecaniques, Mulhouse.

"Don't tell me, Lad, they're putting the knee-action idea into welding machines."

"No, Pop, but you would think so if you welded with the 'Shield-Arc.' It levels out the peaks and valleys in the welding current."

"SHIELD-ARC'S" UNIFORM CURRENT SPEEDS UP WELDING



Time and again the Lincoln *"Shield-Arc"* welder has won competitive tests for speed of welding. There's nothing mysterious about this outstanding performance record. It is simply a matter of advanced design which allows the *"Shield-Arc"* to deliver a uniform current.

The advantage of the *"Shield-Arc's"* uniform current is that you are able to use a higher average current with less splattering and waste of molten electrode metal. Thus with a *"Shield-Arc"* more weld metal is deposited per unit of time . . . in terms of your pocketbook, more weld per dollar.

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8. Dual Control
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"SHIELD-ARC" WELDERS AND ELECTRODES

NEW EQUIPMENT

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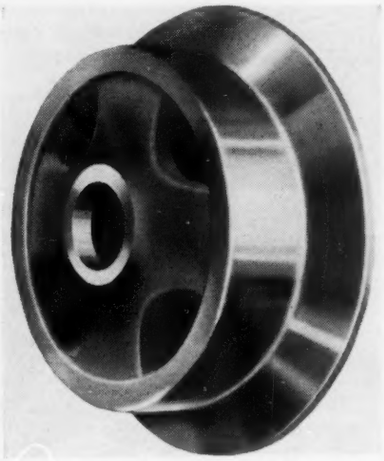
Traction Wheels—National Alloy Steel Co., Blawnox, Pa., is bringing out improved traction wheels for pig casting machines. Use of alloy steels and proper heat treatment enables



National Alloy Steel Co. traction wheel for pig casting machines

the company to produce a traction wheel, shown herewith, that is resistant to abrasion, heat and wear. Wear is greatly reduced because molten metal cannot solidify in the bearings. Openings are provided in the wheels to dispose of spilled metal, iron shot, etc. Foreign materials cannot gather inside the wheel to cause abrasion and wear to the wheel or axle pin, and consequent breakage, it is claimed.

♦ ♦ ♦

Fire Extinguisher—Wil-X Mfg. Corp., 29 Ryerson street, Brooklyn, N. Y., is marketing a new "machine gun" fire extinguisher that has the pump on the outside of the cylindrical container where it cannot gum up, jam, or corrode. The pump never comes in contact with the liquid, only compressing air which forces the liquid out under high pressure. A quick lift of the pump, and the new extinguisher supplies a steady stream of liquid directly at the base of the flames.

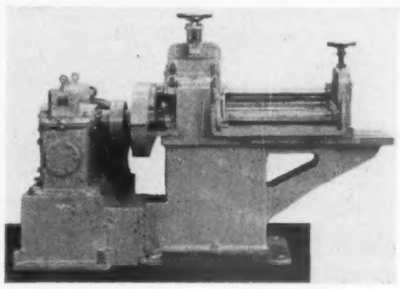
It is easier to aim, and operates with accuracy. Its liquid will not leak or evaporate, for it is hermetically sealed when not in use. The liquid is an absolute non-conductor of electricity, and will also withstand a temperature of 52 degrees below freezing.

♦ ♦ ♦

Brazing Alloy—Handy & Harman, 80-84 Fulton street, New York, is introducing a low melting point brazing alloy in which silver is an important ingredient. This alloy flows freely from 300 to 800 degrees lower than other brazing and welding rods, according to the manufacturer. It is extremely fluid and penetrates deeply into the metals to be joined. Joints made resist shock and continued vibration as has been proved by service on battleships, locomotives, airplanes, automobiles and in electrical and refrigerating equipment. This alloy also resists corrosion as well as the brass or copper with which it is commonly used, and proves valuable in making chemical, food and brewing equipment such as tanks, vats, cooking utensils, stills and in joining pipes and tubing.

♦ ♦ ♦

Gang Slitting Machines—Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., recently developed the application of worm gear motor drives for its standard gang slitting machines. The accompanying illustration shows the drive applied to the standard No. 1 12-inch machine. The control being entirely electrical, this construction eliminates the use of a friction clutch for



Waterbury Farrel worm unit motor-driven 12-inch gang slitter

driving and at the same time results in a simpler and more compact drive. Worm unit and motor are mounted on a heavy box-type baseplate which is tongued and grooved to a finished surface on the left-hand side of the slitter pedestal and securely bolted thereto.

The worm gear drive permits the use of the usual attachments to gang slitters, such as winders of the bracket or floor type, back rolls, coilers, etc. This company also has developed a line of individual motor-driven rotary scrap cutters. This self-contained portable unit may be placed close to the back of the slitter, employing the usual guides for leading the scrap from the slitter cutters to the rolls.

♦ ♦ ♦

Insulating Blocks — Johns-Manville, 22 East Fortieth street, New York, has announced insulating blocks for temperatures ranging up to 1900 degrees Fahr. The insulation is made of selected and calcined diatomaceous silica, blended and bonded with asbestos fiber. It has a low thermal conductivity and weighs approximately 23 pounds per cubic foot. Block insulation is regularly furnished in standard sizes 3 by 18 inches and 6 by 36 inches, flat and curved, in thicknesses 1 to 4 inches. Other sizes on special order. It also is furnished in pipe insulation form. The manufacturer states that careful selection of insulating materials for use in a furnace or boiler wall not only assures more economical operation but in many cases results in lower construction costs.

♦ ♦ ♦

Diesel Crane—Industrial Brownhoist Corp., 4403 St. Clair avenue, Cleveland, has developed a new No. 8 35—40-ton diesel crane, shown herewith. It incorporates many interesting construction features and while, as the manufacturer claims, it is probably the most powerful diesel crane ever built, it is extremely quiet in operation. The machine is equipped with a three-speed travel mechanism so arranged as to have only the travel gears turning when the crane is traveling. This unit, recently purchased by the Toledo,

HEAVY-DUTY diesel crane built by Industrial Brownhoist Corp., has been designed from the tracks up for diesel (or gas) power. Features include a three-speed travel mechanism

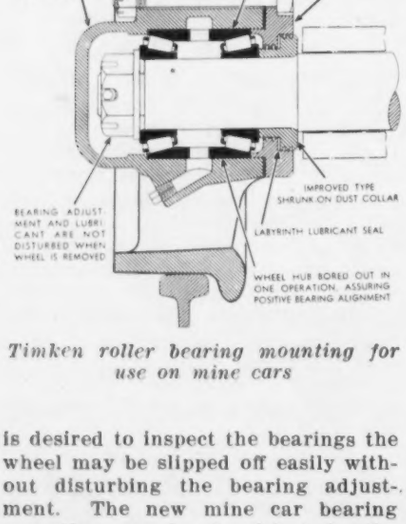
Peoria and Western Railroad, is equipped for bucket, hook or pile driver service.

♦ ♦ ♦

Roller Bearing Mounting—Timken Roller Bearing Co., Canton, O., announces a new type of bearing mounting for mine car service. The new mounting, shown herewith, uses a double cup bearing instead of two single cups. The shrunk in place steel dust collar which is a feature of Timken mine car bearing mountings has been retained, but modified so that it provides a labyrinth seal in conjunction with the inner closure. This eliminates the possibility of loss of lubricant or entrance of grit and water.

Outer sealing is insured in the new design by the elimination of separate end caps on the wheels, the unit being cast in one piece. To remove the new type wheel, all that is required is the loosening of three bolts which clamp the inner closure and wheel in place.

In the new mounting the wheel hub is bored out in a single operation. This insures positive and correct bearing alignment. When wheel replacement is necessary, or when it

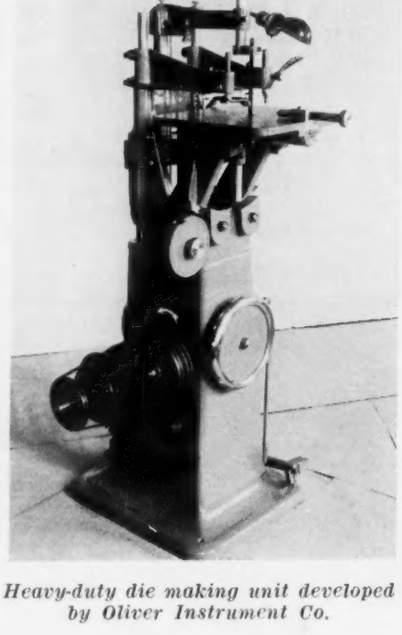

DOUBLE BEARING CUP APPLIED WITH SLIDING FIT ELIMINATES PRESSING-IN AND SIMPLIFIES ASSEMBLY AND DISASSEMBLY
INNER CLOSURE BOLTED TO WHEEL HOLDS DOUBLE BEARING CUP IN PLACE IN WHEEL HUB
ONE PIECE CLOSED END WHEEL DESIGN ELIMINATES SEPARATE END CAP
IMPROVED TYPE SHRUNK ON DUST COLLAR
BEARING ADJUSTMENT AND LUBRICANT ARE NOT DISTURBED WHEN WHEEL IS REMOVED
LABYRINTH LUBRICANT SEAL
WHEEL HUB BORED OUT IN ONE OPERATION, ASSURING POSITIVE BEARING ALIGNMENT

Timken roller bearing mounting for use on mine cars

is desired to inspect the bearings the wheel may be slipped off easily without disturbing the bearing adjustment. The new mine car bearing mounting can be furnished in the closed end wheel, stub and extended axle types.

♦ ♦ ♦

Die Making Machine—Oliver Instrument Co. Inc., Adrian, Mich., recently developed a heavy-duty die making machine. The unit, shown herewith, has a capacity for sawing or filing metal up to 3 inches in thick-



Heavy-duty die making unit developed by Oliver Instrument Co.

ness and for filing still heavier material, with a shorter stroke. The stroke is adjustable from 0 to 5 inches and six speeds ranging from 100 to 300 are provided. Any type ot parallel file or any size of saw from the smallest to heavy machine saws can be held in the clamps.

Saw guides are provided above and below the table, both being easily adjusted or removed when not in use. A continuous blast of air from a pump keeps the work clean. The table is 14 inches square, and tilts 15 degrees to the front, right and left and 3 degrees to the rear. The table is held on a heavy cradle attached to the bed of the machine.

Another feature is the method employed in relieving the saw or file on the up stroke and for feeding the work while filing. This is accomplished by means of a hydraulic feeding device which provides a constant controllable pressure on the down stroke of the ram and relieves the pressure entirely on the up stroke. Feeding pressure may be adjusted by means of a knurled knob at the side of the machine.

The feeding device is so arranged that it requires the constant attention of the operator. If it is left to itself, it will feed a short distance and stop, so that work cannot be spoiled by an operator leaving the machine running without attention.

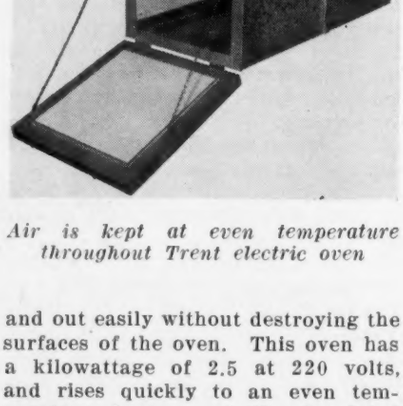
♦ ♦ ♦

Rubber Used in Putty—B. F. Goodrich Rubber Co., Akron, O., has brought out a new putty, similar in appearance and consistency to ordinary putty, with the exception that it is combined with rubber. Of unusual interest is the fact that the new compound requires no mixing, since it contains practically no oil. It effectively resists corrosive chemicals and fumes and, because of its rubber content, offers high resistance to moisture. Another noteworthy property, is its high degree of adherence to steel surfaces. Plastikon putty, as it is known, is being marketed in 15, 75, and 225-pound cans as well as in pint cans.

♦ ♦ ♦

Electric Oven—Harold E. Trent Co., 618-640 North Fifty-fourth street, Philadelphia, recently brought out an electric oven, shown in the accompanying illustration, with inside dimensions of 2 by 2 by 4 feet. By means of a circulating fan the air is maintained at an even temperature throughout the oven. Temperature is controlled by means of precision thermostats capable of operating within 70 degrees plus or minus the 1 degree Cent. setting of the oven. Electrical heating units are placed on a shelf which is in two parts and can be drawn out from either end of the oven. Heating units are in two banks, each bank being controlled separately by means of a thermostat.

The equipment is self contained, heaters, fan motor, and thermostats being assembled to the casing. The two sides and top wall are pressed asbestos. Bottom of the unit is covered with steel so that the material to be treated may be moved in



Air is kept at even temperature throughout Trent electric oven

and out easily without destroying the surfaces of the oven. This oven has a kilowattage of 2.5 at 220 volts, and rises quickly to an even temperature because of the insulated walls.

♦ ♦ ♦

Lubricating Device—Joseph Dixon Crucible Co., Jersey City, N. J., is marketing a new lubricating device or

Sailor leaping from deck of lighthouse tender to the deck of a light buoy in order to inspect lamp which requires attention twice a year.

Footwork!

Performance of duties frequently involves hazardous footwork. The light buoy is only a picturesque example chosen from many. Accident statistics make terribly plain what a difference there may be between the foot that slips and the foot that holds.

Carnegie Floor Plate contributes to both safety and efficiency at little cost. On elevated platforms, bridges, stairtreads, boiler-room and industrial floorings, and a wide range of other uses, it makes footing both secure and comfortable. Different gauges and dimensions for various uses. Inquiries invited.

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH • PENNSYLVANIA 265

CARNEGIE FLOOR PLATE

air gun which utilizes Microfyne flake graphite. The gun, shown herewith, is made of rubber and when squeezed deposits the graphite where needed in measured amounts through controlled air pressure. Measured or graphite volume is controlled largely by the position of nozzle in relation to the dial on top of gun. The nozzle may be turned to a complete shut-off position, making the gun practical to carry in tool kits without spilling graphite.

A plug fitted to the bottom of the gun and easily snapped in and out, carries a disk of chamois for use as a burnisher. The gun comes filled, ready for use, but when necessary to refill, the head may be quickly unscrewed, exposing a large opening through which is inserted a spout attached to the refill cans of graphite. A 2-inch nozzle is standard with each gun but an 8-inch nozzle may be secured at small extra cost.

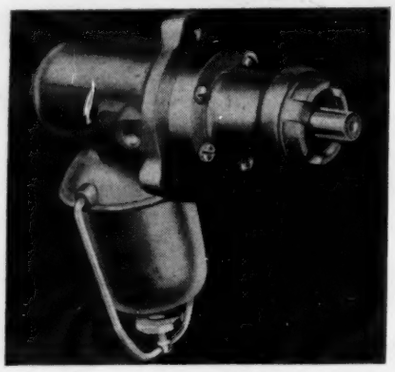
Dixon air gun for depositing graphite as lubricant

Microfyne graphite provides oilless, greaseless, temperature-proof, combustion-proof, dripless, odorless lubrication on metal, wood, rubber, leather, paper, fibre, composition, varnish, lacquered or painted surfaces. It is also used as a co-lubricant with plain oil or grease, being blown into oil holes or upon oiled or greased surfaces or mixed with plain oil or grease before applying.

♦ ♦ ♦

Automatic Fuel Unit—Sundstrand Machine Tool Co., Rockford, Ill., is marketing a new automatic fuel unit for pressure atomizing oil burners. The unit, shown herewith, consists of a variable displacement pump and strainer, the pump automatically taking care of the work done by valves, thus entirely eliminating all of the valve mechanism previously required to operate a pressure-type oil burner.

This new pump displaces with no by-passing only as many gallons of fuel per hour as is determined by the nozzle size, the pump automatically pumping the correct volume without requiring any adjustment for different sized nozzles. Automatic air relief or air bleed also is incorporated. The unit is unusually small and compact, with extremely few parts. Other features include full pressure and volume at the start of combustion, with instantaneous and positive cut-off of oil to the nozzle, so that there is no dripping of oil when the burner is stopped. The pump runs quietly with low power consumption, as only the fuel that is actually burned is pumped.



Sunstrand fuel unit for pressure atomizing oil burners

♦ ♦ ♦

Motor Starter—Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland, is announcing a type ZO weather-proof and dust-tight across-the-line motor starter, shown herewith. The unit is designed for motors up to 15 horsepower, 220 volts, and 30 horsepower 440-550 volts. These starters are enclosed in a case which has been bonderized and then black enameled. When desired, a self-contained ammeter in a dust-tight case also can be furnished. The starter is arranged for remote control, push button automatic operation.

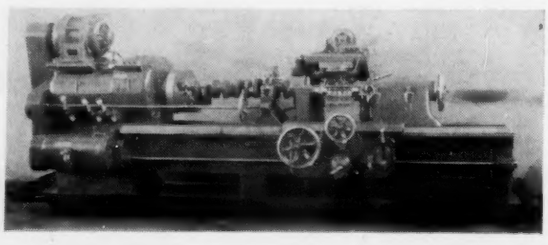
Motor starter designed by Electric Controller & Mfg. Co.

♦ ♦ ♦

Semiautomatic Lathe — Wickes Bros., Saginaw, Mich., has developed a semiautomatic lathe which is being used for machining operations on crankshafts. The unit, shown herewith, has a 12-speed headstock, with power feed through quick-change gear box and arranged for motor drive through a multiple V-belt. Automatic stops are provided for both front and back tools.

One of the outstanding features of the machine is the fact that the rear cutting tools are carried on an inverted cross slide. As the crankshaft revolves, the pressure on the front tools is downward and the load is therefore taken up on the front cross slide. However, as the crankshaft revolves, the pressure on the rear tools is upward and the load, therefore, is taken directly against the inverted cross slide which, in turn, is carried in the heavy back tool housing. This permits the taking of heavy cuts without chatter of the tools.

WICKES semiautomatic crankshaft lathe has a 12-speed headstock. Rear cutting tools are carried on an inverted slide.



Projects Further Research On Windbracing Design

Arrangements have been completed by the American Institute of Steel Construction with Ohio State university, Columbus, O., to complete the first series of tests that have been started at that institution with a steel model of a windbraced three-panel bent. The work will be carried on at the engineering experiment station of the university during this summer and the next year, following which an analysis and report on the tests will be made to the institute. Tests will be under the direction of Prof. Clyde T. Morris and George E. Large.

This is one part of a comprehensive investigation undertaken by the American Institute of Steel Construction into the question of windbracing design for tall buildings. In 1925 observations were started on the behavior of the steel framing of the American Insurance Union building at Columbus. When the Empire State building in New York was erected special instruments were installed so that wind pressures, wind velocities and stress and strain measurements could be taken on the beams as well as columns in that building.

From these actual tests and from model experiments it is expected to obtain valuable data which will add materially to present day knowledge as relating to tall buildings.

Endows Fellowship for Study In Aluminum Metallurgy

A graduate fellowship for research study in some field of metallurgy connected with aluminum has been established at the Carnegie Institute of Technology by the Aluminum Co. of America, Pittsburgh. The fellowship, to run two years, will be awarded to a graduate student selected by Dr. R. F. Mehl, director of the Carnegie Tech metals research laboratory, under whose guidance the study will be made. The grant will become effective Sept. 1.

Chrome Plated Copper Sheets Decorate Fair Building

(*Concluded from Page* 31)

with chromium and later polished to high luster. Large sheets of this metal were converted by the Major Equipment Co., Chicago, into what is known as continuous trough reflectors and taken to the Ford building, where they were installed within a week after the first shipment of metal had been made from the Apollo plant. Had it been necessary to plate these reflectors with chromium after they had been formed it would have taken several weeks in the average commercial plating shop; costs would have been increased and considerable inconvenience would have resulted.

Reflectors total a few hundred feet more than 6000 feet in length and are placed along the front wall of the balcony facia and on the outside columns.

New Trade Publications

DIE HEADS—Eastern Machine Screw Corp., New Haven, Conn., has prepared a bulletin on its general purpose self-opening die heads, illustrated and described in detail.

SPOT WELDERS—A leaflet by the Westinghouse Electric & Mfg. Co., Pittsburgh, illustrates and describes a new line of spot and projection welding equipment for manual or motor operation.

BALL BEARINGS—New Departure Mfg. Co., Bristol, Conn., has issued two bulletins on new bearings it has designed for mine car wheels and for conveyor rolls. The new bearings are illustrated and described and full data are given.

PLASTIC CEMENT—A. P. Green Fire Brick Co., Mexico, Mo., has published a booklet on its quick patch plastic for the preparation of monolithic refractory furnace linings. Illustrations show the adaptability of the company's products to such use.

GALVANNEALED SHEETS—Metallurgical reasons for its claim of superior wearing quality of the zinc coating on its galvannealed sheets form the subject of a bulletin by the Republic Steel Corp., Youngstown, O. A table of gages and sizes in which these sheets are available is included.

CAPACITORS—General Electric Co., Schenectady, N. Y., has published a booklet describing its line of capacitors for power-factor improvement. It describes and illustrates the type of equipment available, discusses the application of capacitors and advantages from their use.

PROFILE PROJECTOR—R. Y. Ferner Co., Investment building, Washington, agent for Societe Genevoise d'Instruments de Physique, Geneva, Switzerland, is distributing catalog No. 577, describing a desk-type projection device for inspection, measurement and photographing of small manufactured articles and various types of materials.

ELECTRICAL EQUIPMENT—Square D Co., Detroit, has prepared about 160 new pages for its looseleaf catalog, No. 37, to bring it up to date. It is also distributing a digest of 40 pages, presenting in condensed illustrated form all the products of its switch and panel division at Detroit and its industrial controller division at Milwaukee.

STOKERS—Link-Belt Co., 910 South Michigan avenue, Chicago, in a current booklet on firing methods modernized for profit presents a comparison of hand firing and controlled automatic underfeeding of boilers from 10 to 250 horsepower. It illustrates in graphic form smoke elimination, uniform temperature and pressure, coal saving and firing efficiency. The book is numbered 1419.

BELT CONVEYOR IDLERS—Idlers for belt conveyors, made of high quality materials and designed to give long life and minimum wear on belts form the subject of bulletin No. 72 by the C. O. Bartlett & Snow Co., Cleveland. Illustrations and data tables cover the various sizes and types.

REFRACTORIES—Plibrico Jointless Firebrick Co., 1800 Kingsbury street, Chicago has published a catalog covering its line of jointless firebrick and other refractory products. Illustrations show the method of installing the firebrick and numerous installations. Mining and preparation of the material also are described.

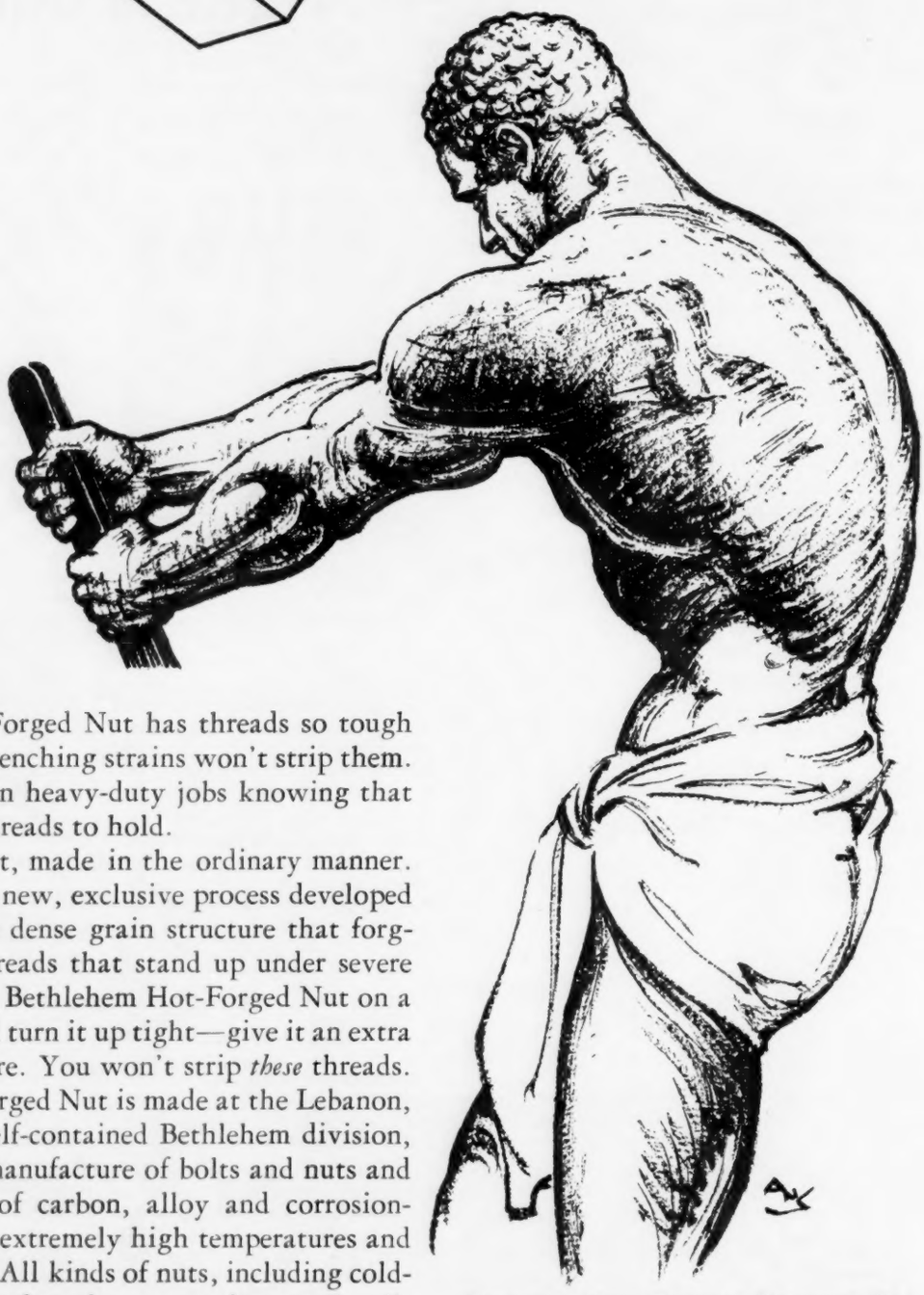
ARC WELDING—Hobart Bros. Co., Troy, O., has published a booklet on electric arc welding, presenting information concerning the process which will assist in the successful application of that equipment to practical work. Information includes equipment, type of welds, weldability of metals, choice of electrodes and operating instructions.

RUST PREVENTIVE — Dearborn Chemical Co., Chicago, has issued a bulletin describing the use of its NO-OX-ID rust preventive in the oil, gas and water industries. Various applications are illustrated, with tables showing requirements of this coating in the treatment of pipe lines and gas holders. Recommended grades of coating for various types of equipment are indicated.

DUST PREVENTION — Northern Blower Co., West Sixty-fifth and Barberton avenue, Cleveland, is issuing a series of monthly folders devoted to dust hazards and their prevention in various industries, mailed free on request made on regular business letterheads. Information is based on authoritative data. It is designed to aid in prevention of occupational sickness and fire and explosion risks.

FURNACES—Standard Fuel Engineering Co., 667 Post avenue, south, Detroit, has published three bulletins dealing with various furnaces; bulletin No. 26 discusses large oven furnaces, gas or oil fired, for annealing, carburizing, heat treating and hardening; bulletin No. 27 describes and illustrates pot furnaces for cyanide salt bath, lead hardening and metal melting, and bulletin No. 28 deals with small oven furnaces for tool steel, annealing, preheating and drawing. Sizes and specifications are given in each case.

Strong Threads



THE BETHLEHEM Hot-Forged Nut has threads so tough and strong that severe wrenching strains won't strip them. It is a nut you can use on heavy-duty jobs knowing that you can depend on the threads to hold.

It isn't an ordinary nut, made in the ordinary manner. It's a forging, made by a new, exclusive process developed by Bethlehem. It has the dense grain structure that forging gives, and strong threads that stand up under severe wrenching strains. Run a Bethlehem Hot-Forged Nut on a bolt, put on a wrench and turn it up tight—give it an extra half-turn for good measure. You won't strip *these* threads.

The Bethlehem Hot-Forged Nut is made at the Lebanon, Pa., Plant, a complete, self-contained Bethlehem division, devoted entirely to the manufacture of bolts and nuts and similar products. Bolts of carbon, alloy and corrosion-resisting steels. Bolts for extremely high temperatures and pressures. Spikes. Rivets. All kinds of nuts, including cold-punched, as well as hot-forged nuts, and treated, oil-quenched and copper-bearing nuts. For your service a wide range of all standard commercial items is regularly carried in stock at Lebanon Plant, ready for immediate shipment.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corporation, San Francisco, Seattle, Los Angeles, Portland, Honolulu. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL

Bethlehem Bolts and Nuts

Steel Rate Down to 59; Shipments Still Strong

Further Decline Indicated This Week as Contracts Near Completion—Mills To Replenish Stocks—July Automobile Schedules Increased

STEELWORKS operations, nearing the close of the most active quarterly period since 1930, are declining less precipitately than anticipated, the national average last week dropping only 3 points to 59 per cent.

Open hearths are being taken off as contract shipments for the month are being completed, and it is probable that a more marked reduction will ensue this week.

As the third quarter approaches, the unpromising outlook in the markets is relieved to some extent by several favorable factors. The apparent remoteness of a steel strike, and an increase in schedules for July automobile production in response to a stronger retail demand, contrary to the usual seasonal trend, are tending to maintain the industry's morale.

For some time in July, steelmakers themselves face the necessity of manufacturing for stock to round out depleted inventories. For the first time since the industry's code was adopted last fall, purchasing practice is evidently reverting to a hand-to-mouth basis—the incentive for contracting having been swept away by the recent code revisions. This dictates preparedness for spot orders.

Some support also is derived from definite construction projects and railroad requirements, and prospective naval shipbuilding in eastern yards. Scrap prices show increasing strength with advances in several districts.

Books Barren of Orders for Third Quarter; Price Reductions Announced at Duluth

Steelmakers, however, have seldom approached a quarter with such meager order books as they have today. Consumers have been acquiring material for use in July, and market prospects now pivot on how quickly those stocks can be absorbed. The last-minute rush for deliveries has been keenest for those products, sheets and strip, which carry the highest price advances, ranging from $5 to $8 a ton, beginning July 1.

Steelmakers now express little apprehension regarding their ability to complete all second quarter contracts by the end of this week, except possibly for certain grades of sheets and strip. Cancellations of June tonnage quotas to some leading producers average about 20 per cent. The tonnage actually delivered this month has been less than in May; for several important interests, only 50 to 60 per cent of last month's—which, however, was the heaviest since 1929.

The new price levels to which the industry is moving are practically untested. So far they have resisted pressure from automobile and parts manufacturers, who for the present are withholding new commitments. Nut and bolt prices have been reaffirmed for third quarter. Cast pipe is up $2 a ton.

A reduction of $1 a ton in steel bars, billets, blooms and slabs at Duluth has been filed, effective June 30.

Structural Shape Awards Are Heavier; 18,000 Tons of Plates Placed for Pipe Line

Structural shape awards for the week increased to 23,757 tons, including 6900 for a government dam at Fort Peck, Mont. An award of 18,000 tons, distributed to two fabricators, for the San Francisco bay pipe line, features the market for plates.

The PWA has finally approved a loan to the Baltimore & Ohio railroad to build 820 coal cars in its own shops. Great Northern is to rebuild 650 refrigerator cars.

A promissory contract for 3000 tons of new billet steel bars is reported to have been negotiated between the Youngstown Sheet & Tube Co., and Fort Pitt Bridge Works, in return for the recent award of 3000 tons of shapes for a strip mill building by the Sheet & Tube company to Fort Pitt.

Steelworks operations last week declined 7 points to 63 per cent at Chicago; 4 to 62, Youngstown; 11 to 47, Buffalo; 1 to 76, Cleveland; ½-point to 46, eastern Pennsylvania. They were unchanged at 82, Detroit; 70, New England; 81, Wheeling; 56, Pittsburgh; 55, Birmingham.

Due to recent adjustments in black pipe, STEEL's iron and steel scrap composite this week is up 29 cents to $35.06, and the finished steel composite is up 70 cents to $55.50. The iron and steel scrap composite has advanced 8 cents to $10.37.

COMPOSITE MARKET AVERAGES

	June 23	June 16	One Month Ago May, 1934	Three Months Ago March, 1934	One Year Ago June, 1933	Ten Years Ago June, 1924
Iron and Steel Composite	$35.06	$34.77	$34.77	$32.40	$28.73	$40.61
Finished Steel Composite	55.50	54.80	54.80	51.10	45.30	64.38
Steelworks Scrap Composite	10.37	10.29	11.30	12.30	9.55	13.97

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	June 23, 1934	May 1934	March 1934	June 1933
Finished Material				
Steel bars, Pittsburgh	1.90	1.90	1.75	1.60
Steel bars, Chicago	1.95	1.95	1.80	1.70
Steel bars, Philadelphia	2.19	2.19	2.04	1.91
Iron bars, Terre Haute, Ind.	1.85	1.75	1.60	1.65
Shapes, Pittsburgh	1.85	1.85	1.70	1.60
Shapes, Philadelphia	2.05½	2.05½	1.90½	1.65
Shapes, Chicago	1.90	1.90	1.75	1.70
Tank plates, Pittsburgh	1.85	1.85	1.70	1.55
Tank plates, Philadelphia	2.03½	2.03½	1.88½	1.49½
Tank plates, Chicago	1.90	1.90	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	2.00	2.00	1.75	1.65
Sheets, No. 24, hot ann., Pitts.	2.65	2.65	2.25	2.10
Sheets, No. 24, galvan., Pitts.	3.25	3.25	2.85	2.70
Sheets, No. 10, hot rolled, Gary	2.10	2.10	1.85	1.80
Sheets, No. 24, hot anneal., Gary	2.75	2.75	2.35	2.25
Sheets, No. 24, galvan., Gary	3.35	3.35	2.95	2.85
Plain wire, Pittsburgh	2.30	2.30	2.20	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.60	2.60	2.35	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	30.00	30.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	26.00	26.00
Billets, open-hearth, Pittsburgh	29.00	29.00	26.00	26.00
Wire rods, Pittsburgh	38.00	38.00	36.00	35.00

	June 23, 1934	May 1934	March 1934	June 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.26	17.26
Basic, Valley	18.00	18.00	17.00	15.00
Basic, eastern, del. eastern Pa.	19.76	19.76	18.76	16.19
No. 2 foundry, del. Pittsburgh	19.26	19.26	18.76	16.76
No. 2 foundry, Chicago	18.50	18.50	17.50	16.00
Southern, No. 2, Birmingham	14.50	14.50	13.50	12.00
No. 2X, Eastern, del. Philadelphia	20.63	20.63	19.63	16.76
Malleable, Valley	18.50	18.50	17.50	15.50
Malleable, Chicago	18.50	18.50	17.50	16.00
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.88	18.88	18.38	16.63
Ferromanganese, del. Pittsburgh	89.79	90.24	90.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$12.00	12.80	14.35	11.65
Heavy melting steel, eastern Pa.	10.50	10.90	11.70	9.50
Heavy melting steel, Chicago	9.75	10.85	12.00	8.80
No. 1 wrought, eastern Pa.	11.25	11.55	12.75	10.25
No. 1 wrought, Chicago	9.50	10.25	10.80	8.10
Rails for rolling, Chicago	11.25	12.15	12.75	10.25
Coke				
Connellsville, furnace, ovens	3.60	3.45	3.35	1.80
Connellsville, foundry, ovens	4.60	4.60	4.25	2.40

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	2.00c
Gary, base	2.10c
Chicago, del.	2.13c
New York, del.	2.33c
Philadelphia, del.	2.29c
Birmingham, base	2.15c
St. Louis, del.	2.32c
F.o.b. cars, dock Pacific ports	2.55c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.65c
Gary, base	2.75c
Chicago, del.	2.78c
Detroit, del.	2.85c
New York, del.	2.98c
Philadelphia, del.	2.94c
Birmingham, base	2.80c
St. Louis, del.	2.97c
F.o.b. cars, dock, Pacific ports	3.25c

GALVANIZED No. 24

Pittsburgh, base	3.25c
Gary, base	3.35c
Chicago, del.	3.38c
Philadelphia, del.	3.54c
New York, del.	3.58c
Birmingham, base	3.40c
St. Louis, del.	3.57c
San Francisco, f.o.b. cars, dock	3.85c

TIN MILL BLACK No. 28

Pittsburgh, base	2.85c
Gary, base	2.95c
St. Louis, del.	3.17c

COLD ROLLED No. 10

Pittsburgh, base	2.55c
Gary, base	2.65c
Detroit, delivered	2.75c
Philadelphia, del.	2.84c
New York, del.	2.88c
F.o.b. cars, dock, Pacific ports	3.15c

COLD ROLLED No. 20

Pittsburgh, base	3.15c
Gary, base	3.25c
Detroit, delivered	3.35c
Philadelphia, del.	3.44c
New York, del.	3.48c

ENAMELING SHEETS

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.90c
Long ternes, No. 24 unassorted	3.65c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.85c
New York, del.	2.13c
Philadelphia, del.	2.03½c
Boston, del.	2.25c
Buffalo, del.	2.08½c
Chicago or Gary, base	1.90c
Cleveland, del.	2.03½c
Birmingham, base	2.00c
Coatesville, base	1.95c
Sparrows Pt., base	1.95c
Pacific Coast, f.o.b. cars, dock	2.40c
St. Louis, del.	2.12c

Structural Shapes

Pittsburgh, base	1.85c
Philadelphia, del.	2.05½c
New York, del.	2.10¼c
Boston, del.	2.23½c
Bethlehem, base	1.95c
Chicago, base	1.90c
Cleveland, del.	2.03½c
Buffalo, base	1.90c
Gulf ports	2.25c
Birmingham, base	2.00c
Pacific Coast, f.o.b. cars, dock	2.40c

Bars

SOFT STEEL

Pittsburgh, base	1.90c
Chicago or Gary, base	1.95c
Duluth, base	2.10c
Birmingham, base	2.05c
Buffalo, base	2.00c
Cleveland, base	1.95c
Detroit, del.	2.05c
Pacific Coast ports cars, dock, c.i.f.	2.45c
Philadelphia, del.	2.19c
Boston, del.	2.39c
New York, del.	2.23c
Pitts., forg. qual	2.05c-2.55c

RAIL STEEL
To Manufacturing Trade

Pittsburgh base	1.80c
Chicago or Gary, base	1.85c
Moline, Ill., base	1.85c
Cleveland, base	1.85c
Buffalo, base	1.90c

IRON

Terre Haute, Ind....	1.85c
Chicago	1.90c
Philadelphia, base..	1.99c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING

New billet, cut lengths, carlots

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports	2.50c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.....	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer..	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire.....	2.45c
Galvanized fence wire....	2.80c
Woven wire fencing (base column, c.l.).....	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.....	2.10c
20,000 to 59,999 lbs.....	2.05c
60,000 to 99,999 lbs.....	2.00c
100,000 lbs. and over.....	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.55c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo.....	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon van.	0.95

9250.....carbon base plus extras

Strip and Hoops □

Hot strip to 23⅞-in.

Pittsburgh	2.00c
Chicago, base.....	2.10c
Birmingham, base	2.15c
Detroit, delivered	2.20c
Phila., delivered..	2.29c
New York, del.....	2.33c
Cooperage hoop, Pittsburgh	2.10c
Chicago	2.20c
Cold-rolled strip, Pitts., Cleve.	2.80c
Worcester, Mass.	3.00c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi..	$35.00
Do., reroll. qual...	$34.00
Angle bars, mills....	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base....	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread .....70 off	
Rolled thread, ½ x 6 and smaller .....70 off	

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts .....70 off	
Tire bolts .....60 off	
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller. 70 off	
Step bolts .....66 off	
Elevator bolts .....66 off	

NUTS

Semifinished .....70 off	

HEXAGON CAP SCREWS

Milled .....80-10-10 off	
Upset 1-in. smaller .....85 off	

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller....75-10 off	
Do., larger than 1-in..75-10 off	
Headless set screws .....75 off	

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.00c
Struc., c. l., Chicago	3.10c
⅞-in. and smaller, Pitts., Chi., Cleve..70 and 5 off	
Wrought washers, Pitts., Chi., Phila..	6.00 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, buttweld.....	52½
½, butt weld	57½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.....	32%
15,000 ft. or 22,500 lbs.....	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

*6-in. & over, Birm.	$37.00-39.00
*4-in., Birmingham	41.00-42.00
*4-in., Chicago	49.00-50.00
*6 to 24 in., Chicago	46.00-47.00
*6-in & over, east. fdy.	42.00
* Do., 4-in.	45.00

*Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base..$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown..	$29.00
Philadelphia	34.30
Duluth	32.00
Forging, Pitts., Chi. and Buffalo	34.00
Forging, Duluth.....	37.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O.	30.00

SLABS

Pitts., Cleve., Young.	29.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.....	3.60- 3.85
Connellsville fdry...	4.60
Connell. prem. fdy...	5.35
New River fdry.....	6.00
Wise county fdry...	4.25- 5.00
Wise county fur....	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del...	10.50
St. Louis, del.	9.25
*Birmingham, ovens	6.00
Indianapolis, del.....	8.75
Cincinnati, del.....	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.....	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha.....	0.26
Commercial xylol....	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)..	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound,

†Naphthalene flakes and balls, in bbl. ..	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Sparrows Point, Md.	19.50	.....	19.00	.....
From Swedeland, Pa., del. to Phila.	20.26	20.76	19.76	.....
From Bethlehem, del. to Brooklyn	21.77	22.27	.....	.....
From Bethlehem, del. to Newark, N. J.	20.89	21.39	.....	.....
Basing Point:				
Everett, Mass.	19.50	20.00	19.00	20.50
From Everett, del. to Boston	20.00	20.50	19.50	21.00
Basing Point:				
Buffalo	18.50	19.00	17.50	19.50
From Buffalo, del. to Boston	20.00	20.50	19.50	21.00
Basing Points:				
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, O.	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
From Detroit, del. to Saginaw, Mich.	20.60	20.60	20.10	21.10
From Cleveland, del. to Akron, Canton, O.	19.76	19.76	19.26	20.26
From Toledo, del. to Mansfield, O.	20.26	20.26	19.76	20.76
Basing Point:				
Jackson, O.	20.25	20.25	19.75	.....
Hamilton, O.	18.50	18.50	18.00	.....
From Hamilton, del. to Cincinnati	19.51	19.51	19.01	.....
Do., del. to Indianapolis	20.77	20.77	20.27	21.27
Basing Points:				
Duluth	19.00	19.00	.....	19.50
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	19.00	18.00	.....
From Duluth, del. to St. Paul	20.94	20.94	.....	21.44
From Chicago, del. to Milwaukee	19.50	19.50	19.00	20.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	21.40	21.40	20.90	21.90
From Granite City, del. to St. Louis	19.00	19.50	18.50	.....
Basing Point:				
†Birmingham, Ala.	14.50	.....	13.50	19.00
From Birmingham, del. to:				
Boston	19.62	.....	19.50	.....
Newark, N. J.	20.51	.....	.....	.....
Brooklyn, N. Y.	21.39	.....	.....	.....
Baltimore	20.02	.....	19.90	.....
Philadelphia	19.88	.....	19.76	.....
Cleveland	18.62	.....	18.50	.....
Chicago	††18.72	.....	18.60	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron. ††Over 0.70 phos.

Basing Point:	
Provo, Utah	17.50 ..... 17.00 .....

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50

†Off grade material is $19.50

Philadelphia, standard and copper bearing	24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.25	Lake Superior fur.	21.00
Pitts. dist. fur.	18.25	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%..	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.25-17.75
N. F. fdy., 55%.....	7.00
Chrome ore, 48% gross ton, c.i.f.....	$18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%....	24.00
So. Afr., 49-51%....	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago....	54.00
Birmingham, Ala....	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Pa. Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$17.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base..	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20%, dom. fur. spot†..	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload..	85.00
Do., 75 per cent..	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton..	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c *Conn. copper*

Sheets

Yellow brass (high)	14.50
Copper, hot rolled....	16.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base....	9.00

Tubes and Pipes

High yellow brass..	17.00
Seamless copper	17.25

Rods

High yellow brass..	13.00
Copper, hot rolled..	13.25

Anodes

Copper untrimmed..	13.75

Wire

Yellow brass (high)	15.00

Old Metals

Deal, buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.87½-5.12½
Chicago	4.50- 4.75
*Cleveland	5.00- 5.50
St. Louis	4.75- 5.00

Heavy Copper and Wire

New York	6.37½-6.62½
Chicago, No. 1	6.25- 6.50
Cleveland	6.00- 6.25
St. Louis	5.50- 5.75

Composition Brass Borings

New York	4.62½-4.87½

Light Copper

New York	5.25- 5.50
Chicago	5.00- 5.25
*Cleveland	5.00- 5.50
St. Louis	4.75- 5.00

Light Brass

Chicago	2.50- 2.75
Cleveland	2.75- 3.25

Lead

New York	3.00- 3.25
Cleveland	3.00- 3.25
Chicago	2.75- 3.00
St. Louis	3.00- 3.15

Zinc

New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.50- 2.75

Aluminum

Clips, soft, Clev.	11.50-12.50
Borings, Cleveland..	6.00- 6.25
Mixed, cast, Cleve..	9.25- 9.75
Mixed cast, St. L.	9.00-10.00

Secondary Metals

Brass ingot, 85-5-5-5	8.75
Remelt al. St. No. 12	15.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL
Birmingham 9.00-10.00
Boston, dealers 5.50- 5.75
Buffalo, No. 1 11.00-11.50
Buffalo, No. 2 9.50-10.00
Chicago, No. 1 9.50-10.00
Cleveland, No. 1 9.00- 9.50
Cleveland, No. 2 8.50- 9.00
Detroit, No. 1 8.00- 8.50
Detroit, No. 2 7.00- 7.50
Eastern Pa. 10.50
Eastern Pa., No. 2 9.00- 9.50
Federal, Ill. 6.75- 7.00
Granite City, R. R. 7.50- 8.00
Granite City, No. 2 6.50- 7.00
N. Y., deal. R. R. 7.00- 8.00
N. Y., deal. No. 2 5.50- 6.50
Pittsburgh, No. 1 11.75-12.25
St. Louis 6.75- 7.00
Valleys, No. 1 11.50-12.00

COMPRESSED SHEETS
Buffalo, dealers 9.50-10.00
Chicago, factory 8.50- 9.00
Cleveland 8.50- 9.00
Detroit 8.00- 8.50
E. Pa., new mat. 9.50-10.00
Pittsburgh 11.25-11.75
St. Louis 5.00- 5.50
Valleys 11.00-11.50

BUNDLED SHEETS
Buffalo 7.00- 7.50
Cincinnati, del. 6.50- 7.00
Cleveland 7.00- 7.50
Pittsburgh 10.25-10.75
St. Louis 4.00- 4.25

SHEET CLIPPINGS LOOSE
Chicago 5.00- 5.50
Cincinnati 5.00- 5.50
Detroit 4.50- 5.00
St. Louis 3.75- 4.25

STEEL RAILS, SHORT
Birmingham 10.50-11.50
Buffalo 13.00-13.50
Chicago (3 ft.) 11.00-11.50
Chicago (2 ft.) 11.50-12.00
Cincinnati, del. 10.50-11.00
Detroit 10.00-10.50
Pitts., open-hearth, 3 ft. and less 14.00-14.50
St. Louis, 2 ft. & less 9.50-10.00

STEEL RAILS, SCRAP
Boston 5.50- 5.75
Chicago 9.50-10.00
Pittsburgh 11.75-12.25

STOVE PLATE
Birmingham 7.00- 8.00
Boston, dealers 3.25- 3.75
Buffalo 8.50- 9.00
Chicago, net 7.00- 7.50
Cincinnati, dealers 5.00- 5.50
Detroit, net 6.00- 6.50
Eastern Pa. 8.50- 9.00
N. Y., deal. fdry. 6.00
St. Louis 6.00- 6.50

COUPLERS, SPRINGS
Buffalo 13.00-13.50
Chicago, springs 11.00-11.50
Eastern Pa. 13.50-14.00
Pittsburgh 13.75-14.25
St. Louis 8.00- 8.50

ANGLE BARS—STEEL
Chicago 10.50-11.00
St. Louis 7.75- 8.25

LOW PHOSPHORUS
Buffalo, billets and bloom crops 13.00-14.00
Cleveland, billet, bloom crops 13.00-13.50
Eastern Pa. crops 15.00-15.50
Pittsburgh, billet, bloom crops 14.50-15.00
Pittsburgh, sheet bar crops 13.50-14.00

FROGS, SWITCHES
Chicago 9.50-10.00
St. Louis, cut 8.00- 8.50

SHOVELING STEEL
Chicago 9.50-10.00
Federal, Ill. 6.75- 7.00
Granite City, Ill. 6.75- 7.00

RAILROAD WROUGHT
Birmingham 6.50- 7.00
Boston, dealers 6.00- 6.50
Buffalo, No. 1 7.50- 8.00
Buffalo, No. 2 11.00-11.50
Chicago, No. 1 net 8.25- 8.75
Chicago, No. 2 9.50-10.00
Cincinnati, No. 2 7.50- 8.00
Eastern Pa. 10.00
N. Y., No. 1 deal. 7.25- 7.75
St. Louis, No. 1 6.50- 7.00
St. Louis, No. 2 7.50- 7.75

SPECIFICATION PIPE
Boston 4.50- 4.75
Eastern Pa. 9.00
New York, dealers 3.50- 3.75

BUSHELING
Buffalo, No. 1 9.50-10.00
Chicago, No. 1 8.50- 9.00
Cinci., No. 1 deal. 6.00- 6.50
Cincinnati, No. 2 7.00- 7.25
Cleveland, No. 2 7.00- 7.25
Detroit, No. 1 new 7.00- 7.50
Valleys, new No. 1 11.00-11.50

MACHINE TURNINGS
Bimingham 4.50- 5.00
Boston, dealers 1.25- 1.50
Buffalo 4.50- 5.00
Chicago 5.50- 6.00
Cincinnati, dealers 4.50- 5.00
Cleveland 5.00- 5.50
Detroit 4.50- 5.00
Eastern Pa. 5.50- 6.00
New York, dealers 2.00- 2.50
Pittsburgh 7.50- 8.00
St. Louis 4.00- 4.50
Valleys 7.50- 8.00

BORINGS AND TURNINGS
For Blast Furnace Use
Boston, dealers 3.25- 3.50
Buffalo 6.00- 6.50
Cincinnati, dealers 4.50- 5.00
Cleveland 5.50- 6.00
Detroit 5.50- 6.00
Eastern Pa. 6.00
New York, dealers 1.50- 1.75
Pittsburgh 7.50- 8.00

CAST IRON BORINGS
Birmingham, plain 4.50- 5.00
Boston, chemical 8.50- 9.00
Boston, dealers 3.25- 3.50
Buffalo 6.00- 6.50
Chicago 5.50- 6.00
Cincinnati, dealers 4.50- 5.00
Cleveland 6.00- 6.50
Detroit 5.50- 6.00
E. Pa., chemical 12.00-15.00
New York, dealers 1.50- 1.75
Pittsburgh 7.50- 8.00
St. Louis 4.00- 4.25

PIPE AND FLUES
Cincinnati, dealers 4.75- 5.25

RAILROAD GRATE BARS
Buffalo 6.50- 7.00
Chicago, net 6.75- 7.25
Cincinnati 4.50- 5.00
Eastern Pa. 8.50
New York, dealers 5.00- 5.50
St. Louis 4.00- 4.50

FORGE FLASHINGS
Boston, dealers 3.75- 4.25
Buffalo 9.50-10.00
Cleveland 8.00- 8.50
Detroit 6.50- 7.00

FORGE SCRAP
Boston, dealers 4.00- 4.50
Chicago, heavy 11.00-11.50
Eastern Pa. 9.00- 9.50

ARCH BARS, TRANSOMS
St. Louis 10.00-10.50

AXLE TURNINGS
Boston, dealers 4.50- 5.00
Buffalo 9.00- 9.50
Chicago, elec. fur. 8.50- 9.00
Cleveland 6.00- 6.50
Eastern Pa. 11.00
St. Louis 6.00- 6.25

STEEL CAR AXLES
Birmingham 10.00-10.50
Boston, ship, point. 9.00- 9.50
Buffalo 13.00 13.50
Chicago, net 10.75-11.25
Eastern Pa. 14.00-15.00
St. Louis 10.00-10.50

SHAFTING
Boston, ship point. 10.25-10.50
Eastern Pa. 16.00
New York, dealers 10.75-11.25
St. Louis 11.00-11.50

CAR WHEELS
Birmingham, iron 8.50- 9.00
Boston, iron deal. 6.50- 6.75
Buffalo, iron 12.25-12.75
Buffalo, steel 13.00-13.50
Chicago, iron 10.00-10.50
Chicago, rolled steel 10.50-11.00
Cincinnati, iron 8.00- 8.50
Eastern Pa., iron 11.50-12.00
Eastern Pa., steel 13.50-14.00
Pittsburgh, iron 11.25-11.75
Pittsburgh, steel 13.75-14.25
St. Louis, iron 7.50- 8.00
St. Louis, steel 8.00- 8.50

NO. 1 CAST SCRAP
Birmingham 9.00- 9.50
Boston, No. 2 5.50- 6.00
Boston, tex. con. 10.50-11.00
Buffalo, cupola 9.50-10.00
Buffalo, mach. 11.50-12.00
Chicago, agri. net 7.50- 8.00
Chicago, mach. net 8.50- 9.00
Chi., railroad net 8.00- 8.50
Cinci., mach. cup 9.50-10.00
Cleveland, cupola 11.75-12.25
Detroit, net 8.50- 9.00
Eastern Pa., cupola 12.00
Pittsburgh, cupola 13.00-13.50
San Francisco, del. 13.50-14.00
Seattle 7.00- 8.50
St. Louis, No. 1 7.00- 7.50
St. L., No. 1 mach. 8.50- 9.00

HEAVY CAST
Boston, del. 5.50- 5.75
Buffalo, break. 8.00- 8.50
Cleveland, break. 8.25- 8.75
Detroit, break. 6.50- 7.00
Detroit, auto net 9.00- 9.50
Eastern Pa. 10.50
N. Y., No. 1, deal. 7.00- 7.50
N. Y., break. deal. 6.50- 7.00
Pittsburgh 10.00-10.50

MALLEABLE
Boston, consum. 12.50-12.75
Buffalo 12.00-12.50
Chicago, R. R. 10.50-11.00
Cincinnati, agri. del. 8.00- 8.50
Cinci., R. R. del. 9.00- 9.50
Cleveland, rail 12.00-12.50
Detroit, auto 8.50- 9.00
St. Louis, R. R. 8.25- 8.75
Eastern Pa., R. R. 11.50-12.00

RAILS FOR ROLLING
5 feet and over
Birmingham 10.00-11.00
Boston, dealers 7.00- 7.25
Buffalo 12.00-12.50
Chicago 11.00-11.50
Eastern Pa. 12.00-13.00
New York, dealer 7.50- 8.00
St. Louis 9.00- 9.50

LOCOMOTIVE TIRES
Chicago (cut) 11.00-11.50
St. Louis, No. 1 9.50- 10.00

LOW PHOS. PUNCHINGS
Buffalo 13.75-14.25
Chicago 11.00-11.50
Eastern Pa. 14.50-15.00
Pittsburgh 13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead: New York N. Y.	Lead: East St. L.	Zinc: St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
June 16	9.00	9.12½	8.75	50.50	50.55	4.00	3.85	4.20	*22.90	7.85	36.00
June 18	9.00	9.12½	8.75	50.30	50.35	4.00	3.85	4.20	*22.90	7.85	36.00
June 19	9.00	9.12½	8.75	51.00	51.05	4.00	3.85	4.20	*22.90	7.85	36.00
June 20	9.00	9.12½	8.75	51.00	51.05	4.00	3.85	4.20	*22.90	7.90	36.00
June 21	9.00	9.12½	8.75	50.80	50.80	4.00	3.85	4.20	*22.90	7.90	36.00
June 22	9.00	9.12½	8.75	51.10	51.05	4.00	3.85	4.20	*22.90	7.90	36.00

*Nominal range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	☐
Baltimore*....	3.00c
Boston††	3.05c
Buffalo	2.95c
Chattanooga..	3.41c
Chicago	3.05c
Cincinnati	3.25c
Cleveland	3.05c
Detroit	3.13½c
Houston	3.00c
Los Angeles..	3.70c
New Orleans	3.40c
New York‡(d)	3.32c
Pittsburgh(h)	3.00c
Philadelphia*	3.00c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.29c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	☐
Portland	3.40c
Baltimore*....	3.00c
Chattanooga..	3.41c
Chicago	2.75c
Cincinnati	3.25c
New York‡(d)	3.32c
Philadelphia*	3.00c
St. Louis	3.29c
Tulsa	3.25c

REINFORC. BARS	☐
Buffalo	1.95c
Chattanooga..	3.41c
Chicago 2.10c-2.60c	
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl...	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.15c
Pitts., twisted squares (h)	3.27½c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.44c
Tulsa	3.25c
Young. 2.30c-2.60c	

SHAPES	☐
Baltimore*....	3.00c
Boston††	3.22c
Buffalo	3.20c
Chattanooga..	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland	3.36c
Detroit	3.45c
Houston	3.00c
Los Angeles..	3.70c
New Orleans	3.60c
New York(d)	3.42c
Philadelphia*	3.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

PLATES	☐
Baltimore*....	3.00c
Boston††	3.13c
Buffalo	3.20c
Chattanooga..	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland, ¼-in. and over	3.36c
Detroit	3.30c
Detroit, ¼-in.	3.65c
Houston	3.00c
Los Angeles..	3.70c
New Orleans	3.60c
New York(d)	3.45c
Philadelphia*	3.00c
Phila. floor....	5.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	☐
Baltimore*....	3.20c
Boston††	3.40c
Buffalo	3.10c
Chattanooga..	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det., 8-10 ga.	3.28½
Houston	3.35c
Los Angeles..	3.80c
New Orleans	3.70c
New York.....	3.42c
Portland	3.75c
Philadelphia*	3.20c
Pittsburgh(h)	3.10c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.44c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	☐
Baltimore*†..	3.76c
Boston (g)....	4.15c
Buffalo	3.25c
Chattanooga..	4.41c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	4.16c
Detroit	4.185c
Los Angeles..	4.35c
New York.....	4.05c
Philadelphia*†	3.80c
Pittsburgh**..	3.80c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis.....	3.94c
St. Paul.....	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	☐
Baltimore*†..	4.36c
Buffalo	4.00c
Boston (g)....	4.75c
Chattanooga..	5.01c
Chicago (h)..	4.70c
Cincinnati	4.85c
Cleveland	4.76c
Detroit	4.85c
Houston	4.40c
Los Angeles..	5.05c
New Orleans	4.95c
New York.....	4.25c
Pitts.** (h)	4.30-4.60c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis.....	4.54c
St. Paul.....	4.19c
Tulsa	5.10c
Philadelphia*†	4.40c

BANDS	☐1
Baltimore*....	3.30c
Boston††	3.40c
Buffalo	3.30c
Chattanooga..	3.76c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.51c
Detroit, ¼-in. and lighter	3.53½c
Houston	3.25c
Los Angeles..	3.90c
New Orleans	3.95c
New York(d)	3.77c
Philadelphia..	3.30c
Pittsburgh(h)	3.85c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul.....	3.20c
Tulsa	3.45c
St. Louis	3.69c

HOOPS	☐
Baltimore.....	2.80c
Boston	4.40c
Buffalo	3.55c
Chicago	3.45c
Cincinnati	3.60c
Det., No. 14 and lighter	3.53½c
New York.....	3.77c
Philadelphia..	3.55c
Pittsburgh(h)	3.85c
Seattle	5.60c
St. Paul.....	3.75c

COLD FIN. STEEL	☐
Baltimore (c)	3.71c
Boston 4.00c-4.50c	
Buffalo (h)....	3.55c
Chattanooga*	4.06c
Chicago (h)..	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.30c
New York...3.92c-4.42c	
Philadelphia..	3.73c
Pittsburgh(h)	3.45c
Portland (f)..	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul.....	3.20c
St. Louis.....	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	☐
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	5.25c
Chicago (b)..	3.45c
Cincinnati	5.80c
Cleveland (b)	3.20c
Detroit	3.33c
Philadelphia..	4.00c
New York.....	4.70c
St. Louis.....	5.74c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 21

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	
PIG IRON				
Foundry, 2.50-3.00 Silicon.	$15.12	3 0 0	$7.55	1 11 0
Basic bessemer.....	13.61	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05....	15.25	3 0 6	....	.....
SEMIFINISHED STEEL				
Billets.....	$27.72	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage.....	39.31	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails.....	$39.06	7 15 0	$26.77	5 10 0
Merchant bars.....	1.69c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes.....	1.66c	7 7 6	.68c	3 1 6
Plates, †¼ in. or 5 mm.....	1.80c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.....	2.08c	9 5 0	1.21c to 1.24c	5 10 0 to 5 12 6
Sheets, gal., 24 gage, corr...	2.53c	11 5 0	1.43c	6 10 0
Bands and strips.....	1.86c	8 5 0	.88c	4 0 0
Plain wire, base.....	2.19c	9 15 0	1.18c	5 7 6
Galvanized wire, base.....	2.59c	11 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base.....	2.70c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.....	$ 4.35	0 17 3	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5.....	$17.01	3 7 6(a)	$12.54	190	$14.51	310	$24.02	63
Basic bessemer pig iron....	16.38	3 5 0*	12.21	185	13.57	290	26.49	(b)69.50
Furnace coke.....	4.41	0 17 6	7.92	120	5.15	110	7.34	19.25
Billets.....	27.72	5 10 0	28.38	430	20.59	440	36.79	96.50
Standard rails.....	1.86c	8 5 0	2.10c	700	2.31c	1,100	2.28c	132
Merchant bars.....	1.94c	8 12 0	1.68c	560	1.16c	550	1.90c	110
Structural shapes.....	1.97c	8 15 0	1.65c	550	1.16c	550	1.86c	107.50
Plates,†¼-in. or 5 mm.....	1.91c	8 10 0	2.10c	700	1.47c	700	2.20c	127
Sheets, black.....	2.36c	10 10 0§	2.55c	775‡	1.63c	775‡	2.49c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	2.93c	13 0 0	4.50c	1,500	3.15c	1,500	6.40c	370
Plain wire.....	2.19c	9 15 0	3.39c	1,100	2.31c	1,100	2.99c	173
Bands and strips.....	2.36c	10 10 0	1.95c	700	1.47c	700	2.20c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 54

Pittsburgh—Prices of 1.90c, Pittsburgh, on merchant steel bars and 2.55c, Pittsburgh and all basing points, on alloy steel bars, are unchanged for third quarter but few buyers have bought for shipment over that time. However, because considerable spot business in bars has been turned down by producers the past few weeks in order that they could accommodate their contract customers, it is possible that a test of the market may come sooner than expected in July.

Cleveland — Due to cancellations of portions of June contract quotas by some consumers, mills last week were able to continue receiving specifications for delivery before July 1. No difficulty is expected in getting out all the material wanted. For some important producers the tonnage of bars specified this month so far is only 50 to 60 per cent of that in May, which was the largest month for them in more than ten years.

Chicago—Bar sales and specifications continue to decline slowly, part of the decrease in specifications accounted for by lack of time to complete shipments before expiration of low-priced contracts. Soft steel bars are 1.95c, Chicago or Gary, with rail steel 1.85c and bar iron 1.90c, Chicago.

Duluth—Effective June 30, the price of merchant steel bars here has been reduced $1 a ton to 2.05c, base, Duluth.

Boston — Commercial steel, alloy and forging bar shipments in June are the heaviest in months, but few consumers stocked heavily. Some buyers, expecting a rise in cold-finished stock which has not developed, took heavier shipments than would otherwise been the case.

Philadelphia — Commercial steel bar sellers report third quarter contracting as light, although one large interest declares that contracts had been coming through in better volume than he had expected earlier in the month. The market is 1.90c, Pittsburgh, or 2.19c, Philadelphia.

Cold Finished

Cold Finished Prices, Page 55

Pittsburgh—Effective July 1 and for the third quarter, prices on turned and ground shafting, Pittsburgh base, are to be based on the prices of cold-finished carbon bars, plus extras for turning and grinding. The following extras are to be in effect for latter finish: 1⅛ inch, $1.30; 1 3/16 to 1½ inch, $0.80; 1 9/16 to 1⅞ inch, $0.65; 1 15/16 to 2⅞, $0.50; and 2 15/16 to 7 inch, $0.35. Unchanged extras apply for quality, analysis, etc., with tolerances on turned and ground shafting holding unchanged at minus 0.002 for 1⅛ to 2 7/16 inch bars and minus 0.003 for 2½ inch and larger. Practically no interest has been shown in third quarter for either carbon or alloy cold-finished steel bars and the past week's shipments have not been heavy. The market is quoted unchanged at 2.10c, Pittsburgh, on carbon bars and 3.05c, Pittsburgh, on alloy cold-drawn.

Plates

Plate Prices, Page 54

Pittsburgh—Midland Barge Co. is reported to have been awarded approximately 300 tons of pontoon pipe for the United States engineers at Vicksburg, Miss., bids on which were taken recently. Kansas City engineers open bids July 16 on 3000 feet of 28-inch fabricated steel pipe made from ¼-inch plates for delivery at Fort Peck dam, Montana. Railroad plate buying still is confined to small miscellaneous lots for repair work and tank builders have only small projects on which to figure. The market is unchanged at 1.85c base, Pittsburgh.

Cleveland—As the close of the month approaches when all second quarter contracts must be completed business has been more diversified and miscellaneous. Various fabricators have taken the opportunity to acquire material for requirements immediately in view. This resulted for some producers in a slightly better tonnage last week. New buying has not developed any considerable volume.

Chicago—Plate demand shows little change but moderately better activity is noted in some fabricated products. Tank builders report a gain in inquiries from miscellaneous industrial users. A fair volume of tank business is pending for various distilleries and the chemical industry is making some purchases. Railroad plate requirements are steady.

Boston—Plate mills in several instances are pushed to make delivery in New England before the end of the quarter and the advent of 1.95c, Coatesville, Pa., on all business. Demand for specified work is active. Little coverage has been made by contract for third quarter but some miscellaneous volume has moved at the new price.

New York—Plate sellers expect continued good demand from oil companies to offset partially a substantial drop expected in specifications at the close of the quarter. Platemakers expect a large inquiry from the navy early in July with opening of bids in August. Private yards will be asked to quote on 12 vessels, including two destroyer leaders, three destroyers, three submarines, one heavy and one light cruiser. The remaining seven destroyers, three submarines and two light cruisers will be built in navy yards.

Philadelphia—Plate production is being well maintained at the highest rate in more than a year, although a sharp drop is expected upon completion of shipments against current contracts at the end of this month. Inquiry is sluggish but includes some fair miscellaneous requirements for railroads for next quarter. The market is 1.95c, Coatesville, Pa., or 2.03½c, Philadelphia.

Contracts Placed

18,000 tons, San Francisco bay pipe line crossing, Hetch Hetchy project, San Francisco, allocated as follows: 13,000 tons to Western Pipe & Steel Co., San Francisco, 5000 tons to American Concrete & Steel Pipe Corp., Los Angeles.

500 tons, tanks, Kilgore, Tex., to Muskogee Iron Works, Muskogee, Okla.

450 tons, plates and shapes, 1,000,000-gallon tank and tower, Rocky Mount, N. C., to Chicago Bridge & Iron Works, Birmingham, Ala., $54,800; bids June 14; D. J. Rose, Rocky Mount, awarded contract for foundation, valve vault and chain link fence at $7468.50.

400 tons, two storage tanks, Valvoline Oil Co., Edgewater, N. J., to Chicago Bridge & Iron Works, Chicago.

300 tons, pontoon pipe for Vicksburg, Miss., engineers; reported placed with Midland Barge Co., Midland, Pa.

200 tons, 1,000,000-gallon standpipe, Sharon, Mass., to McClintic-Marshall Corp., Bethlehem, Pa.

165 tons, three water tanks, North Wilkesboro, N. C., to R. D. Cole Mfg. Co., Newnan, Ga.

120 tons, 200,000-gallon elevated tank, Lexington, Ky., to W. E. Caldwell Co., Louisville, Ky.

Unstated, buoys for lighthouse service, to Commercial Iron Works, Portland, Oreg.

Unstated tonnage, 10,000-gallon elevated tank, Prosperity, S. C., to R. D. Cole Mfg. Co., Newnan, Ga., $7335.

Contracts Pending

1400 tons, 44 dredge pontoons and pipe, U. S. engineer, Vicksburg, Miss.; McClintic-Marshall Corp., Bethlehem, Pa., low.

250 tons, welded steel pipe, Spec. 1440, Los Angeles; Western Pipe & Steel Co., Los Angeles, low.

140 tons, black sheets, license plates for state of Oregon; bids opened.

100 tons, 24-inch welded pipe, Lemon

Grove and Spring Valley irrigation district, La Mesa, Calif.; bids June 30.
100 tons, boiler for county hospital, Stockton, Calif.; bids June 25.
100 tons, elevated steel tank, Hallettsville, Tex.
Unstated tonnage, 3000 feet 28-inch welded steel pipe from ¼-inch plates, for delivery to Ft. Peck dam, Montana; bids July 16 to Kansas City army engineers.

Sheets

Sheet Prices, Page 54

Pittsburgh — Spot sheet specifications diminished last week although producers still were busy in rolling and shipping second quarter tonnage. It is expected there will be some buying of sheets early in the third quarter, a condition which was not looked for six weeks ago. Reports from the automotive industry indicate assemblies in July will reverse the usual downward trend. All sheet prices hold unchanged.

Cleveland—Some orders and contracts for sheets for delivery in the third quarter have been booked, but the tonnage in the orders exceeds that in the contracts. The orders also are mainly for early shipment in July. Consumers have released all the material they expect to receive this month. Some producers report their cancellations of second quarter tonnage at the close of this month will be about 20 per cent of their total. Large consumers apparently took a larger portion of their commitments than did small buyers. Mill operations are lower.

Chicago — Activity in sheets consists principally of the completion of shipments against old orders since consumers show little interest in making third quarter commitments. Operations are near capacity and producers are encountering difficulty in making delivery of all the specified tonnages before July 1. Some material now being shipped is destined for future consumption and demand early next quarter is expected to be light.

Boston—Sheet buyers show slight interest in the third quarter. Fairly heavy shipments are coming into New England, notably galvanized.

New York—Sheet consumers, having specified freely in most cases against second quarter contracts, are believed not likely to do much buying over the next few weeks. Some routine contracting for next quarter is noted, but little forward interest.

Philadelphia — Sheet contracting for next quarter is developing slowly, with most sellers looking for little consuming interest in the next month. Two radio manufacturers in this district released substantial tonnages against second quarter contracts to carry them well into the summer. Prices are steady.

Cincinnati—Sheet mills in this district will continue at capacity in some departments throughout this month to complete second quarter orders, improved specifications from automotive interests being a feature of the past week.

Railroads

Track Material Prices, Page 55

Placing of miscellaneous steel needs for third quarter and some track accessories makes up most of the railroad participation in the present market. Fruit Growers Express, New York, which opened bids June 18, is distributing its requirements. Atlantic Coast Line is considering bids on bars, small shapes and reinforcing bars. Norfolk & Western is taking bids on plates, shapes, bars, pipe and nails. The Virginian is taking bids on bars and small shapes, Seaboard Air Line on spikes, angles, channels, bars and small shapes and Norfolk Southern on about 100 tons of miscellaneous steel. Pittsburgh & Lake Erie will open bids June 27 on car and locomotive axles and steel tubes.

New York Central is expected to inquire for its third quarter requirements during the week of June 25.

Frog and switch manufacturers have been buying moderate tonnages of rails, making a fair aggregate. Rail mills at Pittsburgh have received specifications for practically all tonnage on their books. One producer in that area has about 12,000 tons of rails for July rolling. Some buying of track fastenings is being done but in small lots.

Baltimore & Ohio has been formally awarded a PWA loan of $1,000,000, which with $505,000 supplied by the road will finance 820 coal cars to be built in its own shops. Pullman Car & Mfg. Corp. will reopen its shops at Bessemer, Ala., soon and start fabrication of 200 seventy-ton steel hopper cars for the Central of Georgia, requiring 3500 tons of steel, and 700 steel box cars for the Seaboard Air Line.

Great Northern is in the market for a substantial tonnage of steel for rebuilding 650 refrigerator cars in its own shops. Western Maryland has withdrawn its inquiry for 20 cabooses and the Seaboard Air Line for five locomotives. Chicago, Milwaukee, St. Paul & Pacific has withdrawn its inquiry for 31 locomotives, reported to be because of failure of financing arrangements.

Relaying rail prices are unchanged but it is expected lighter sections may be advanced after July 1, when $35 per ton on new billet light rails is effective.

Pipe

Pipe Prices, Page 55

Pittsburgh — High rate of activity in the market for tubular goods continues as June nears expiration. Shipments of oil country goods this month probably will be the highest of any month in at least four years, but this showing is expected to taper sharply in July.

Chicago — Cast pipe prices have been advanced $2 a ton, with standard fittings $10 a ton higher. Class B 4-inch pipe now is $49 to $50, Chicago, according to quantity, with 6-inch material and over, $46 to $47. Fittings are $100, Birmingham, Ala. Orders in this district still are light despite the large number of pending projects. Many municipalities are encountering difficulties in effecting release against old orders and in some instances projects on which bids have been asked have been delayed for several months in making awards.

Boston—Bids are in here on 1400 tons of steel pipe for a watermain on Brookline avenue, the first bids being rejected. This is the largest steel pipe inquiry to come out in months. Cast pipe buying has slumped.

New York — Cast pipe inquiry is dull. Prices advanced $2 a ton last week, making class B, 6-inch and over, $42, eastern foundry. New York city bought 400 tons, placing the business with two foundries. Informal low bids have held up placing of 1500 tons for Gloversville, N. Y.

Birmingham, Ala.—Mounting costs of raw material brought an advance of $2 per ton in cast iron pressure pipe, now quoted at $38 to $39 on 6-inch and over, with $41 to $42 on 4-inch. Demand is fairly steady and production is being kept abreast of demands. Inventory at end of first half of year will show little raw material on grounds.

Cast Pipe Placed

645 tons, 4 to 12-inch, class 150, Ordway, Colo., to unnamed interest.
450 tons, 16-inch, Aberdeen, S. Dak., to American Cast Iron Pipe Co., Birmingham, Ala.
400 tons, 6 to 12-inch, New York city,

divided equally, to United States Pipe & Foundry Co., Burlington, N. J., and Donaldson Iron Works, Emaus, Pa.

225 tons, 20-inch with fittings, Rocky Mount, N. C., to Glamorgan Pipe & Foundry Co., Lynchburg, Va., $11,248.10, delivered.

200 tons, Prosperity, S. C., to Lynchburg Foundry Co., Lynchburg, Va.; also valves hydrants and galvanized steel pipe to Grinnell Co.

163 tons, 6-inch, class 150, Glasgow, Mont., to unnamed interest.

125 tons, Fond du Lac, Wis., to United States Pipe & Foundry Co., Burlington, N. J.

100 tons, or more, water system, Thomasville, N. C., to Lynchburg Foundry Co., Lynchburg, Va.

Cast Pipe Pending

9300 tons, 6 to 16-inch, class 150, San Francisco; United States Pipe & Foundry Co., Burlington, N. J., low on 5700 tons; American Cast Iron Pipe Co., Birmingham, low on 1500 tons and National Cast Iron Pipe Co., Birmingham, low on 2100 tons.

1200 tons, Fairport, N. Y.; plans completed, bids soon.

700 tons, 6 and 12-inch, Madison, Wis.; bids closed.

160 tons, 4 and 6-inch, class 150, South Pasadena, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

112 tons, Bonneville dam, Oregon; bids July 6.

Steel Pipe Pending

1400 tons, water main, Brookline avenue, Boston; bids in, city department public works, Boston, June 20.

500 tons, 30-inch, welded, ⅝-inch plate, watermain across Anacostia river, Washington; Interstate Engineering Co. Inc., Baltimore, low.

Unstated tonnage, 2880 feet, 28-inch, ¼-inch plate, United States engineer, Memphis, Tenn.; bids July 16.

Wire

Wire Prices, Page 55

Pittsburgh—Wire products makers generally have nearly completed contracts and as there has been no new buying for early July shipment, a sharp drop in activity is looked for by the end of this week. The market is steady at 2.30c for plain wire, $2.60 per keg on nails, 2.80c on galvanized fence wire, 3.00c for galvanized barbed wire and 2.45c for annealed fence wire, all in carload lots, Pittsburgh or Cleveland base.

Cleveland—The flow of specifications on second quarter contracts has almost stopped, but production holds close to capacity. A few orders have been placed for July delivery, but virtually no contracts for third quarter. The revised code provisions are expected to result in more general buying as material is required, instead of contract commitments. At least one advantage of this is that it will greatly simplify handling of business by mills.

Philadelphia—With specifications in on most grades covered by current contracts, wire sellers are doing little. Few third quarter contracts have been signed to date.

Boston — Most wire mills are rushed to complete shipments against second quarter contracts. Finishing mill operations have broadened. With completion of shipments wire plants making their own ingots will be low on billets and steelmaking operations are expected to hold relatively higher than finishing mills.

Chicago—Wire shipments continue around the rate of the past several weeks. Needs of manufacturers' wire consumers are off moderately from the rate a month ago, although automotive requirements are fairly steady.

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Shapes

Structural Shape Prices, Page 54

Pittsburgh—Although Silas Mason Co., New York, and Walsh Construction Co., Davenport, Iowa, were low on the general contract for the Grand Coulee dam, Washington, when bids were opened at Spokane, Wash., on June 18, there is a possibility that the government will buy some of the materials direct, these including 30,000 to 35,000 tons of steel sheet piling, and an estimated 10,000 tons of structural steel for dam bracing. The open-market quotation on structural shapes holds unchanged at 1.85c, Pittsburgh, and steel sheet piling is quoted 2.15c, Pittsburgh.

Cleveland—The market is quieter, with only a few state bridges on which bids recently were taken now pending. For a state bridge in Pike county, Ohio, 640 tons have been awarded the Mt. Vernon Bridge Co., Mt. Vernon, O. The state has decided to use steel in rebuilding the Lorain avenue bridge over Rocky river, Cuyahoga county, and approximately 2000 tons will be required.

Chicago — State bridge work provides the only important source of activity in this district. Bids have been opened on 2550 tons for four Illinois bridges and these are expected to be awarded shortly. Inquiries are light.

Boston—A fair volume is in prospect here for buildings, although it is slow to reach the active point. Bids are in on several small state hospital buildings.

New York—Steel contracts on two 1800-ton projects, a memorial building at Rochester, N. Y., and an armory, Jersey City, N. J., are about to be closed. Oltmer Iron Works, Jersey City, is low on the armory steel. While additional contracts for the Triboro bridge are expected out next month, new inquiry develops slowly and awards are light.

Philadelphia—Small miscellaneous tonnages continue to provide fabricating shops in this district with fair operations, and a few fair size additional jobs are now being placed, three totaling about 1500 tons. In addition, approximately 1000 tons will be required for a high school at Reading, Pa., on which bids open July 6. Shapes are 1.95c, Bethlehem, Pa., or 2.05½c, Philadelphia.

A substantial tonnage will be required for the vehicular tunnel under the Delaware river here, the states of New Jersey, Pennsylvania and the war department having approved the project.

Shape Contracts Placed

6900 tons, shapes and tunnel liner plates, government dam at Fort Peck, Mont., to American Bridge Co., Pittsburgh; through Silas Mason Co., New York, and Walsh Construction Co., Davenport, Iowa.

4010 tons, plant for Solvay-Process Co., Baton Rouge, La., to R. C. Mahon Co., Detroit.

1000 tons, bridge, Waldport, Oreg., to

Shape Awards Compared

	Tons
Week ended June 23	23,757
Week ended June 16	16,311
Week ended June 9	14,705
This week in 1933	17,373
Weekly average for 1933	15,413
Weekly average, 1934	17,166
Weekly average, May	19,866
Total to date, 1933	389,580
Total to date, 1934	446,332

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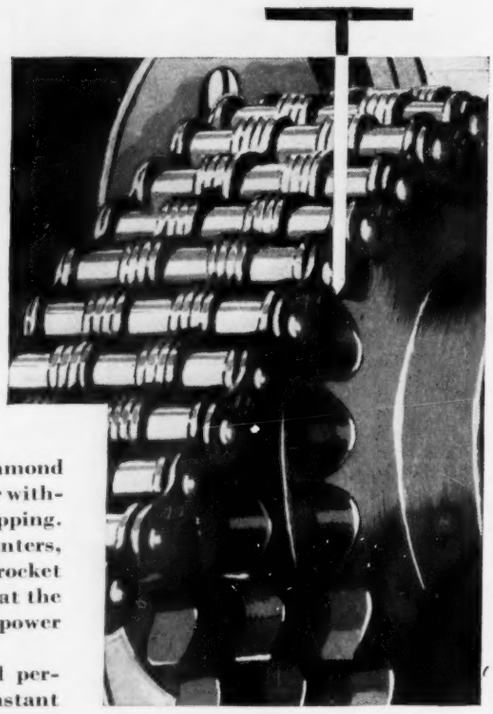

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910 tons, approach to bridge, Vicksburg, Miss., for Vicksburg Bridge & Terminal Co., to McClintic-Marshall Corp., Bethlehem, Pa.

857 tons, stockyards viaduct, Fort Worth, Tex., to Fort Worth Structural Steel Co., Fort Worth; Earl Yates & Son, Fort Worth, general contractors.

750 tons, Sacramento river bridge, Redding, Calif., for state, to Moore Drydock Co., Oakland, Calif.

746 tons, state bridge, Bucks county, Pennsylvania, through Yeo Construction Co., Philadelphia, to McClintic-Marshall Corp., Bethlehem, Pa.

710 tons, highway bridge, Newport, Ark.; 560 tons to McClintic-Marshall Corp., Bethlehem, Pa., and 150 tons to St. Louis Structural Steel Co., St. Louis.

640 tons, state bridge, Pike county, Ohio, to Mt. Vernon Bridge Co., Mt. Vernon, O.

450 tons, bridge, Chicago, for Chicago, Milwaukee, St. Paul & Pacific railroad, to Wisconsin Bridge & Iron Co., Milwaukee.

400 tons, paper roll storage building, Container Corporation of America, Philadelphia, through Schaefer & Co., Philadelphia, to Belmont Iron Works, that city.

400 tons, Baltimore & Ohio railroad, bridge, St. Denis, Md., to McClintic-Marshall Corp., Bethlehem, Pa.

350 tons, bridge, Avoca, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

350 tons, bridges for Southern Pacific railroad to American Bridge Co., Pittsburgh.

325 tons, grade and high school, Wolcott, N. Y., to Smith & Caffrey, Syracuse, N. Y.; through Benz Engineering Co.

310 tons, C. F. Johnson grade school, Johnson City, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; B. Klein, Binghamton, N. Y., general contractor.

300 tons, bridge, Kalamazoo, Mich., to McClintic-Marshall Corp., Bethlehem, Pa.

250 tons, bridge spans, Brownstown, Ind., to Vincennes Bridge Co., Vincennes, Ind.

250 tons, highway bridge, Cataldo, Idaho, for department of agriculture, to McClintic-Marshall Corp., Bethlehem, Pa.

250 tons, bridge, Madrid, Iowa to Pittsburgh Des Moines Steel Co., Pittsburgh.

225 tons, bridge, Wichita, Tex., to American Bridge Co., Pittsburgh.

215 tons, biology building, University of Tennessee, Knoxville, Tenn., to Johnson City Foundry & Machine Co., Johnson City, Tenn.; Worsham Bros., Knoxville, general contractor.

200 tons, factory building, Spring Perch Co., Lackawanna, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.

188 tons, two bridges in California for Southern Pacific railroad, to McClintic-Marshall Corp., San Francisco.

185 tons, buildings and runway for Columbia Steel Co., Torrance, Calif., to Consolidated Steel Corp., Los Angeles.

170 tons, state highway bridge, Warren county, Ohio, to Berger Iron Works, Canton, O.

170 tons, state school for deaf, Scranton, Pa., to Anthracite Bridge Co., Scranton; through H. Blatt Co.

170 tons, state highway bridge, Walpole, N. H., to Lackawanna Steel Construction Corp., Buffalo.

135 tons, bridge, Adams county, Mississippi, to Virginia Bridge & Iron Co., Roanoke, Va.

111 tons, bridge, route 134, Edgar county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

105 tons, including 70 tons for an overhead bridge for the RCA Victor Corp., Camden, N. J., through F. L. Hoover, Philadelphia, and 35 tons for a plant addition for Keystone Drawn Steel Co., Spring City, Pa., to Belmont Iron Works, Philadelphia.

100 tons, San Francisco bay crossing pipe line, Hetch Hetchy project, San Francisco, to Western Pipe & Steel Co., San Francisco.

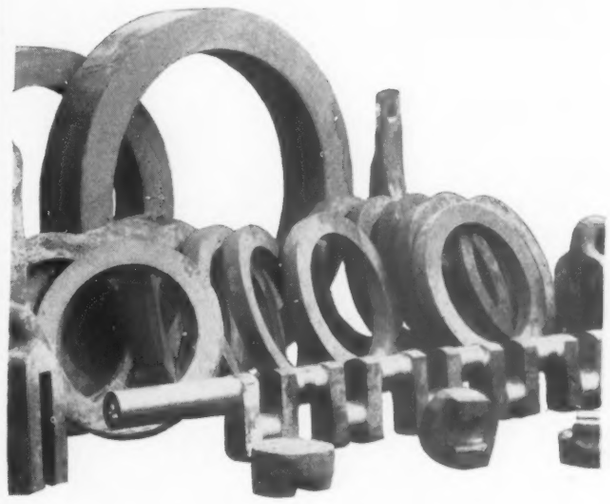
100 tons, specification No. 7581, for Los Angeles county, California, to Youngstown Steel Car Corp., Niles, O.

100 tons, shapes and bars, school, Tuscaloosa, Ala., to Southern Steel Works, Birmingham, Ala., and Truscon Steel Co., Youngstown, O.; J. O. Holloman, Tuscaloosa, general contractor.

100 tons, sheet piling, for lighthouse service depot, Seattle, to Columbia Steel Corp., San Francisco.

Shape Contracts Pending

35,000 tons, steel sheet piling, Grand Coulee dam, Washington, Silas Mason Co., New York, and Walsh Construc-



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Carbon, Chrome, Chrome Molybdenum, Chrome Nickel, Chrome Vanadium, Molybdenum, Nickel, Nickel Molybdenum, Vanadium Billets and Slabs.

tion Co., Davenport, Iowa, low on general contract on bids to federal engineers, Spokane, June 18.

12,128 tons, powerhouse, locks, etc., Bonneville dam project, Oregon; bids to United States district engineer, Portland, Oreg., July 6.

10,000 tons, estimated, structural steel work in bracing for Grand Coulee dam, Washington; Silas Mason Co., New York, and Walsh Construction Co., Davenport, Iowa, low on general contract on bids to federal engineers, Washington, June 16.

1800 tons, armory, Jersey City, N. J.; Oltmer Iron Works, Jersey City, low.

1140 tons, buildings, Linden, N. J., for Distillers Ltd.; bids in.

1000 tons, state viaduct, route 3, Madison county, Illinois; Midland Structural Steel Co., Chicago, low.

1000 tons, estimated, high school, Reading, Pa., bids July 6; approximately 500 tons of reinforcing bars also may be required.

900 tons, state subways, Niles Center, Ill.; American Bridge Co., Pittsburgh, low.

850 tons, bridge, New York Central railroad, West Albany, N. Y.

775 tons, state bridges, Sault Ste. Marie, Mich.

747 tons, 1400-foot 6-span structural steel and reinforced concrete highway overhead bridge, for state, Middletown township, Buck county, Pennsylvania; Yeo Construction Co., Chestnut Hill, Pa., low for general contract.

700 tons, state viaduct, route 8, Peoria, Ill.; Mississippi Valley Structural Steel Co., Decatur, Ill., low.

690 tons, state bridge, Winneconne, Wis.; Worden-Allen Co., Milwaukee, low.

412 tons, substructure and approaches, bridge, Rolling Fork river, Nelson-Hadin counties, Kentucky; Albert Lyons Co., Roversville, Tenn., general contractor.

300 tons, brewery building, Sharpsburg, Pa., for Ft. Pitt Brewing Co., Pittsburgh.

290 tons, Trinity river bridge, route No. 40, Anderson-Freestone county, Tex.; L. H. Lacy Co., Dallas, general contractor.

250 tons, addition, high school, New Bedford, Mass.; Matthew Cummings Co., Boston, general contractor.

240 tons, rigid frame steel girder bridge, for state, City avenue, section 4, lower Merion township, Philadelphia; bids July 3.

230 tons, warehouse, Pt. Ivory, Staten Island, New York, for Proctor & Gamble Co., Cincinnati, O.

225 tons, two bridges, route 29, section 11, to carry highway over tracks of Central Railroad of New Jersey and Lehigh Valley railroad, Hunterdon county, New Jersey; bids July 9.

205 tons, bridge for Southern Pacific railroad, Gaviota, Calif.; bids soon.

200 tons, bridge for Southern Pacific railroad, Lento, Calif.; bids soon.

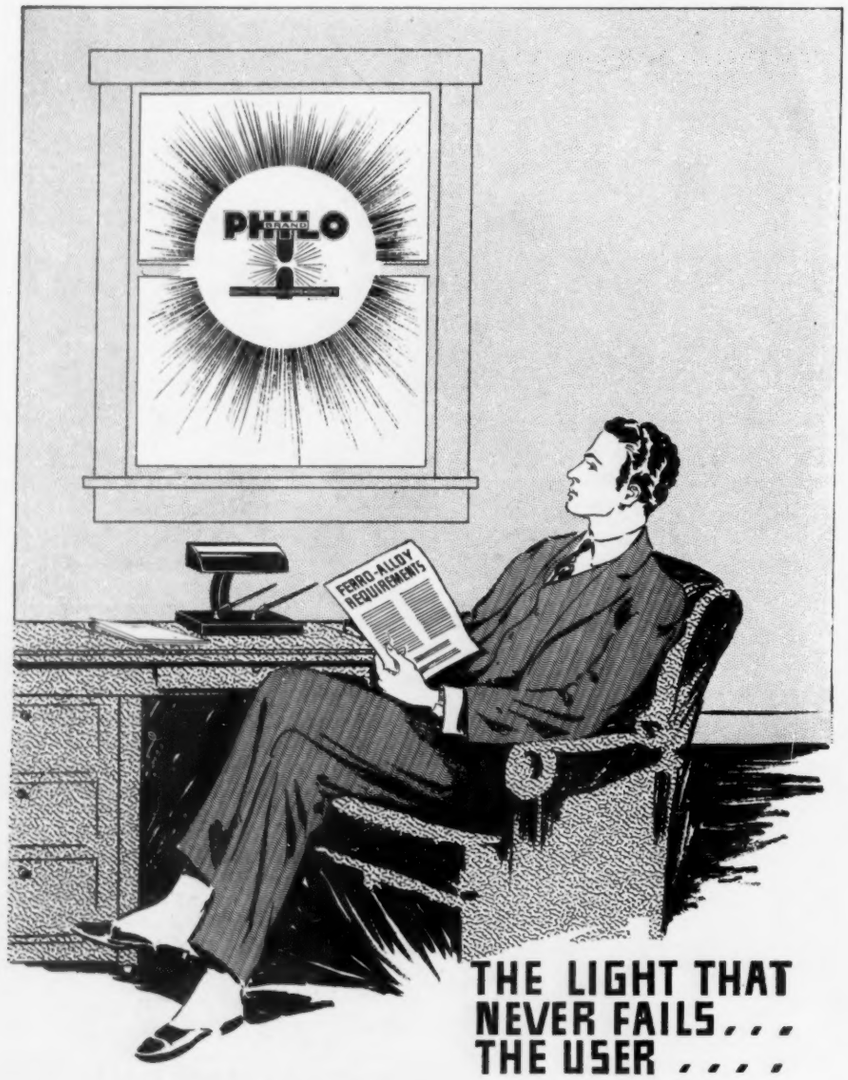
190 tons, New Jersey state highway bridge, Pennington, N. J.

190 tons, state highway bridge over Penobscot river, Medway, Me.

162 tons, 1500-foot 3-track deck, plate girder overhead, for state, Middletown township, Bucks county, Pennsylvania; Bates & Rodgers Construction Co., North Girard, Pa., low for general contract.

150 tons, state bridge, Brownstown, Ind.

148 tons, state bridge, Clymer borough, Indiana county, Pennsylvania; M. Bennett & Sons, Indiana, Pa., low for general contract.



Semifinished

Semifinished Prices, Page 55

A resumption in billet buying by several automotive forge shops featured the semifinished market last week, in addition to continued heavy shipments of tin bars for tin plate rollers, and continued good demand from the small nonintegrated pipe producers for skelp. However, a declining market is evident in wire rods, slabs and sheet bars. The Pittsburgh base prices are firm, as follows: Billets, $29; sheet bars, $30; forging quality billets, $34; alloy billets, $51; and wire rods, $38 per ton. Skelp remains quoted 1.70c per pound.

A reduction of $1 a ton on blooms, billets and slabs to $31, base, Duluth, Minn., and a similar reduction on the forging quality to $36 have been filed to become effective June 30.

Reinforcing

Reinforcing Bar Prices, Page 55

Pittsburgh — A promissory contract for approximately 3000 tons of new billet steel reinforcing bars is reported to have been negotiated recently between Youngstown Sheet & Tube Co. and Ft. Pitt Bridge Works in exchange for a 3000-ton structural shape order which the latter booked for the Sheet & Tube company's new strip mill. Although the low general contract bid has been announced on 12,000 tons of bars for the Grand Coulee dam in Washington, this tonnage may be purchased direct by the government. The new billet steel bar market holds at 2.05c, Pittsburgh, for cut lengths; with 1.90c for rail steel bars.

Cleveland — Current reinforcing bar requirements are restricted to small lots, and the aggregate tonnage is light. Columbus, O., this week is expected to award approximately 2200 tons for a sewer system.

Chicago—Reinforcing bar inquiries and awards continue in their previous number and volume, with orders for private construction usually involving less than 100 tons. Sections 9 and 10 of the Chicago sanitary district, involving 807 and 370 tons, respectively, now are pending, with additional tonnages for this work to be up for bids later.

Boston—Awards are light, but a fair volume remains active, including highway work and bridges. Worcester, Mass., is taking bids on unstated requirements for the remainder of 1934.

New York—Several hundred tons of mesh for New York highways have been placed. Inquiry is strengthened by heavier requirements for New Jersey highway projects, closing early next month. Building needs, however, are light.

Reinforcing Steel Awards

400 tons, Guadalupe river bridge, highway 2, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.; Uvalde Construction Co., Dallas, general contractor. Same fabricator also took 37 tons of structurals for project.

275 tons, Fifteenth street sewer, San Francisco, to Soule Steel Co., San Francisco.

225 tons, Greenwich-Merritt highway, Connecticut, to Truscon Steel Co., Youngstown, O.; through Peter Mitchell Inc.

223 tons, stockyards viaduct, Fort Worth, Tex., to Fort Worth Structural Steel Co., Fort Worth; Earl Yates & Son, Fort Worth, general contractors.

200 tons, for Panama canal commission, schedule 2966, to Jones & Laughlin Steel Corp., Pittsburgh.

175 tons, Sunrise highway, Bayshore-Brookhaven, Suffolk county, New York, to American Steel & Wire Co., New York; through Good Roads Engineering & Contracting Co.

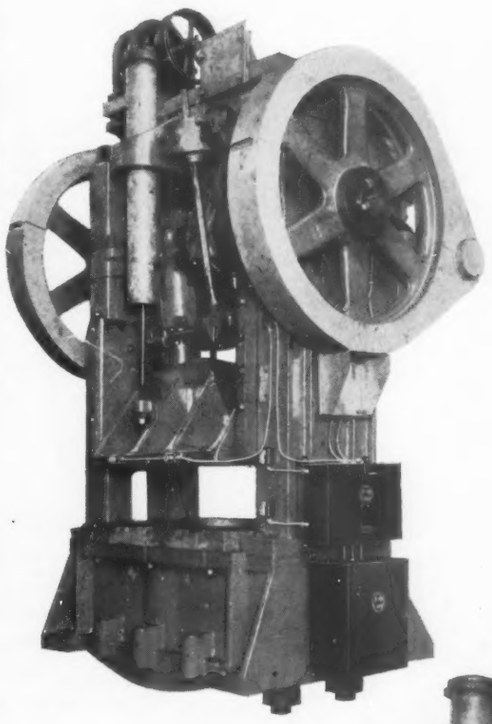
170 tons, sewer, North Yonkers, Westchester county, New York, to Truscon Steel Co., Youngstown, O.; through Clemente Contracting Co.

170 tons, highway, Waterloo, Seneca county, New York, to American Steel & Wire Co., New York; through John Bellardino.

Concrete Awards Compared

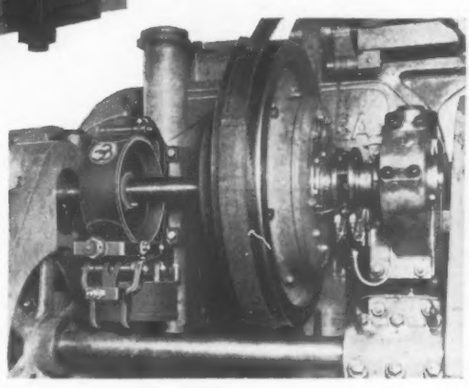
	Tons
Week ended June 23	2,485
Week ended June 16	5,078
Week ended June 9	9,677
This week in 1933	3,067
Weekly average for 1933	3,771
Weekly average, 1934	4,885
Weekly average, May	4,633
Total to date, 1933	77,405
Total to date, 1934	127,006

New Power Press Control Insures Safety



Safety to the operator is one of the main features of the automatic electric control operation of power presses developed by Clark Controller through the use of automatic control panel and electric brake. The power unit actually running the press has no connection with this control unit.

The safety feature is the non-repeat control system of operating the press. The installation illustrated is on a Niagara press although the same unit could be applied to any similar press. Patent pending.



Above illustration is complete view of press showing the automatic control panel while view at the right shows the electric brake unit.

THE CLARK CONTROLLER CO.
1146 East 152nd St.
Cleveland, Ohio

127 tons, state bridges in Elbert and Lincoln counties, Colorado, to unnamed interest.

120 tons, Illinois highway work, to Calumet Steel Co., Chicago.

100 tons, highway, in Connecticut, to American Steel & Wire Co., New York; through D. V. Frione & Co. Inc.

100 tons, state undercrossing at Spokane, Wash., to Pacific Coast Steel Corp., Seattle.

100 tons, specification 1450, for Los Angeles county, Calif., to Soule Steel Co., Los Angeles.

100 tons, Sacramento river bridge, Redding, Calif., to unnamed interest.

Reinforcing Steel Pending

12,000 tons, estimated, Grand Coulee dam, Washington; Silas Mason Co., New York, and Walsh Construction Co., Davenport, Iowa, low on general contract on bids to federal engineers, Spokane, June 18.

1177 tons, Chicago sanitary district; bids closed on 807 tons for section 9, bids on 370 tons for section 10 to be asked soon by sanitary district board.

300 tons, chemistry building for University of California, Los Angeles; bids opened.

250 tons, building for General Aniline Works, Grasselli, N. J.; bids June 27.

250 tons, Kentucky state highway grade elimination project at Lexington, Ky.; general contract to Temple Foundation Co., Cincinnati.

210 tons, highway, route 25, section 12, Bridgeboro to Cinnaminson road, Burlington county, New Jersey; July 9.

170 tons, Bayside high school, Queens, N. Y., general contract bids in June 25; bids of June 12 rejected.

156 tons, reinforced highway overhead bridge, for state, Middletown township, Bucks county, Pennsylvania; Yeo Construction Co., Chestnut Hill, Pa., low.

150 tons, substructure and approaches, Rolling Fork river, Nelson-Hadin counties, Kentucky; Albert Lyons & Co., Rogersvile, Tenn., general contractor.

105 tons, state hospital, Rockland county, New York.

103 tons, two bridges, route 29, section 11, to carry highway over tracks of Central Railroad of New Jersey and Lehigh Valley railroad, Hunterdon county, New Jersey; bids July 9.

100 tons, Trinity river bridge, route 40, Anderson-Freestone county, Texas; L. H. Lacy, Dallas, Tex., general contractor.

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BACKED BY 50 YEARS OF EXPERIENCE

Strip Steel

Strip Prices, Page 55

Pittsburgh—Buying in strip steel, especially hot-rolled is for spot delivery with little interest in early third quarter. Buyers in some instances are accumulating stocks but most users prefer to pay 2.00c, Pittsburgh, base on hot-rolled strip steel and 2.80c, Pittsburgh or Cleveland, base for cold-rolled strip rather than gamble with heavy inventories.

Cleveland — Only in demand for strip and in those grades of sheets on which prices also have been advanced $5 to $8 a ton has there been a last-minute rush of specifications here to obtain delivery by mills before July 1. Cold-rolled strip mills are operating close to capacity and some producers express doubts of ability to deliver all the tonnage called for by contracts.

Chicago—Strip orders for third quarter delivery are light and consumers are more interested in taking shipment against contracts than in making future commitments. Shipments continue heavy and producers have been forced to refuse business in some grades for June delivery. Prices continue 2.10c, Chicago, for hot-rolled strip and 2.80c, Pittsburgh-Cleveland, for cold-rolled.

Boston—Most cold-rolled strip mills will have completed second quarter shipments by the end of the week, but in some cases are operating at a high rate to do so. No interest in third quarter requirements is shown by buyers and lower rolling operations are expected about July 1,

when 3.00c, Worcester, becomes effective on all cold strip.

New York—The strip market is dull, with consumers well covered by shipments against current contracts. Hot strip is 2.33c, New York, and cold strip 3.13c.

Philadelphia—Strip sellers are preparing for a rather quiet few weeks. Buyers specified freely against second quarter contracts and the opinion prevails that by the end of this quarter most will have enough material on hand to meet requirements for July at least. Hot strip is 2.00c, Pittsburgh, or 2.29c, Philadelphia, and cold strip 2.80c, Pittsburgh, 3.09c, Philadelphia.

Warehouse

Warehouse Prices, Page 58

Pittsburgh — Dissipation of the steel strike threat has reacted unfavorably on the warehouse market, as there jobbers had expected a strike would throw considerable mill business to them. Due also to seasonal influences, the volume of shipments and specifications for warehouse steel locally has been declining. No change has occurred recently in prices.

Cleveland—Demand for steel products from warehouse here is quieter than in recent weeks. Sellers have adjusted their prices to the recent mill revisions in mechanical and boiler tube lists.

Chicago—Sales are slightly less active, but business this month compares favorably with the May volume. Prices are unchanged.

New York — Warehouse volume continues below that of last month, some jobbers reporting the drop as much as 25 per cent. The decline is general on practically all lines.

Detroit—Shipments of steel from store are close to the volume of May, with prices steady.

Cincinnati—Demand for steel from warehouse has held close to the May level on numerous small orders from industrial sources. Quotations are unchanged.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 55

Prices on bolts, nuts and rivets for third quarter have been reaffirmed and no change will be made from the existing level of 70 off on bolts and nuts, 70 and 5 off on small rivets, 3.00c, Pittsburgh and Cleveland, and 3.10c, Chicago, on large rivets.

Jobbers, railroad and structural shops all are taking less tonnage than a month ago from Pittsburgh producers.

Specifications at Chicago recently have been well maintained, partly due to approaching expiration of contracts. Consumption in the automotive and farm implement industries has moderated slightly, and requirements of miscellaneous consumers in some other instances also are tending downward.

Tin Plate

Tin Plate Prices, Page 54

Pittsburgh—At 70 per cent of capacity last week, tin plate mill operations showed a decline of about 5 points. Even at this rate, operations are in excess of shipping specifications. Many canmakers bought heavily up until ten days ago in anticipation of a steel strike. The tin mill black sheet base of 2.85c, Pittsburgh, and the tin plate base box quotation

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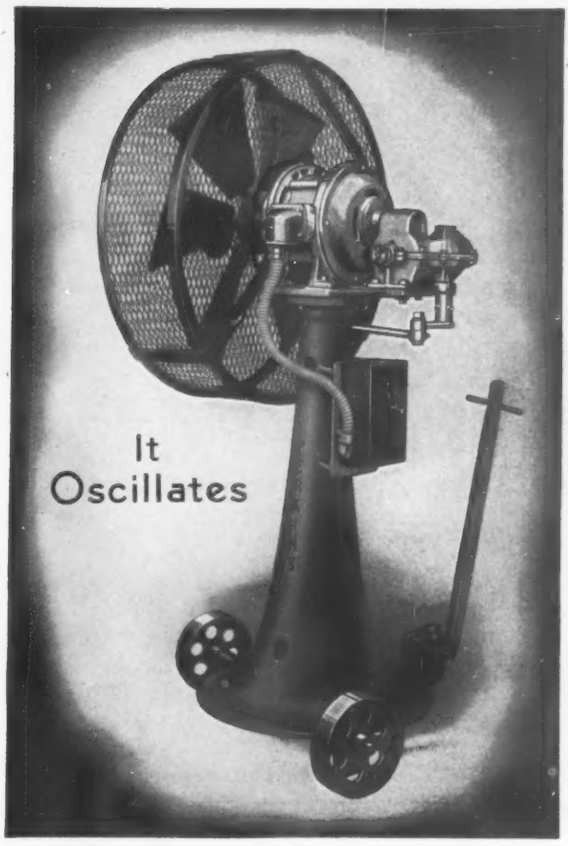

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of $5.25 base, Pittsburgh, continue unchanged for the third quarter.

New York—Tin plate specifications are declining, this being attributed largely to drought conditions and the fact canmakers covered heavily at the close of last year prior to price advances.

Pig Iron

Pig Iron Prices, Page 56

Pittsburgh — Merchant pig iron furnaces are rapidly running through their backlogs and, with little new buying, outlook for early third quarter is not encouraging. Stocks of pig iron in the hands of foundries and non-integrated steelmakers are considerably higher than in some months. Without significant test the market is quoted $18.50 for foundry grades, $19 on bessemer analysis and $18 on basic pig iron, all local base.

Cleveland—Some melters, unable to take all the tonnage due them on second quarter contracts before July 1, have had the unspecified portions canceled, and in consideration of this have placed equivalent or larger orders for third quarter. Otherwise, business for third quarter has been restricted to a few carloads. Currently, shipments continue heavy.

Chicago—June deliveries will set a new high mark for any month during the past several years despite some cancellations. The latter are expected to be less than 25 per cent of iron booked for delivery this quarter, but at the same time a sharp decrease in deliveries is in prospect for July. Buyers are apathetic toward third quarter contracting and smaller consumers are expected to buy on a spot basis rather than to commit themselves for their quarterly needs. While some instances of higher foundry schedules are noted, the tendency continues downward. Farm implement manufacturers are reducing schedules.

New York—The majority of pig iron consumers appear to be taking out tonnage to the full extent of their contracts for this quarter. This situation, however, is expected to make for little buying over the next few weeks, for shipments now moving are substantially in excess of actual consumption.

S. Weinstein Supply Co., New York, is low on 179 tons of foundry pig iron for the Norfolk, Va., navy yard.

Boston—Shipments against second quarter contracts have been heavy, but little buying has been done for third quarter. The larger consumers have fair stocks, but some of the smaller foundries have little iron on hand. Foundry melt is low. Several hundred tons of Indian iron arrived last week. Foundry by-product coke price is unchanged for the last half.

Philadelphia — Heavy shipments feature this month's activity in pig iron. Deliveries of one eastern seller are already four times greater than those in May. Little new tonnage, however, is coming out and producers generally look for dullness throughout July and possibly into August.

Buffalo—One blast furnace is being dropped in a steelworks unit this week, reducing the number in production here to six. Shipments this month surpass those of any previous period of the year by a wide margin.

Cincinnati—Nearly as much pig iron will be shipped this month as in the combined months of April and May, according to the present rate. Although the melt is resisting seasonal decline, iron going into stock will preclude heavy purchasing in the next few weeks.

St. Louis—The stove industry in this district, operating at capacity for some months, has begun to slow down, following a 10 per cent increase in wages and 7½ per cent boost in prices. Foundries supplying agricultural implement manufacturers report that orders canceled because of drouth conditions are being reinstated with improvement in the crop situation.

Birmingham, Ala.—Deliveries have been steady as melters take iron purchased for second quarter and all spot trading specifying immediate delivery. Production continues steady despite ore miners' strike, now in its seventh week.

Toronto, Ont.—Merchant sales for the past week were light, with total volume below that for preceding weeks. Most melters have sufficient iron at hand, although stocks are not large. Production holds at about 1000 tons daily.

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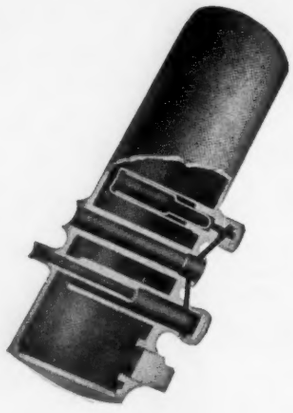

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Metallurgical Coke

Coke Prices, Page 55

Although beehive coke prices hold steady and unchanged the lack of going business is still keenly felt. The furnace coke market, Connellsville oven basis, continues $3.85, except where $3.60 is available on a yearly contract. Medium sulphur Connellsville furnace coke remains

$3.60 per ton with standard furnace coke $4.60 and premium foundry coke $5.10. Until June 15 a discount of 40 cents a ton had been allowed from the domestic coke price, which was $3.75, Connellsville ovens, but it is expected this will be reduced to 20 cents a ton.

Foundry coke shipments at Chicago show a moderate decrease from the May rate and June deliveries are expected to be 10 to 15 per cent below May. Announcement of July prices will be made the end of this week, the market currently being $8.50, ovens, for outside delivery and $9.25, delivered Chicago.

At Cincinnati shipments have been well sustained. At Birmingham the market has been strong and foundry coke has been advanced 50 cents a ton to $6. Birmingham.

Scrap

Scrap Prices, Page 57

Pittsburgh — Lifting of shipping suspensions at other points bolstered dealers' buying prices last week and the market on important open-hearth grades in Pittsburgh showed a nominal advance of 25 cents a ton. As yet the revised quotation of $11.75 to $12.25 on No. 1 heavy melting steel has not been adequately tested by fresh mill buying, but such is soon confidently expected. A further encouraging factor to the market is the general state of depletion among consuming mills' scrap inventories.

Cleveland—Stronger sentiment in other scrap consuming centers is reflected here and holders of steel and iron scrap are unwilling to sell at present prices. Melters are not seeking tonnage as stocks are sufficient for the present. Prices are nominally unchanged.

Chicago — Scrap has a stronger tone despite little buying. Some small orders for No. 1 heavy melting steel have been placed recently at prices that leave the market unchanged at $9.50 to $10. Prospects for the placing of larger orders are slightly more favorable.

Boston—Scrap prices are steadier but buying is dull. The Worcester, Mass., consumer is taking a few cars but is not actively seeking material. Demand for outside shipment is dull.

Buffalo—Several grades of scrap are nominally weaker although tonnage sales are lacking. Heavy melting steel has failed to profit locally by slightly stronger trends in some other markets.

New York — The first upturn in scrap prices in weeks is a 50-cent rise on machine shop turnings. Export business has declined and several eastern steel mills have bought more scrap. Shipments to Eastern Pennsylvania have been heavier, notably from Jersey City.

Cincinnati — Dealers in iron and steel scrap are awaiting a turn in the situation to relieve present inactivity. Mills have adequate supplies and refuse to buy except in scattered lots at their own prices.

Philadelphia — Scrap prices are unchanged, with the tendency toward softness, especially on steelmaking grades, which so far this month have been moving fairly briskly to cover requirements of mills in getting out contracts expiring June 30.

Detroit—No. 1 heavy melting steel and hydraulic compressed sheets are unchanged at $8.50 to $9, blast furnace scrap being quoted $5.50 to $6 and machine shop turnings $4.50 to $5. The market is steady with the

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trade expecting little change in prices immediately.

St. Louis—Prices of steel and iron scrap were readjusted during the week, some items being advanced slightly, others lowered. Little scrap is coming in from the country as prices have been too low to permit handling and shipping at a profit.

Birmingham, Ala. — Melters are keeping purchases down to the smallest tonnages possible and prices are weak and irregular.

Toronto, Ont.—Demand for iron and steel scrap continues specialized. Consumers are taking iron scrap and there is little demand for steel for domestic needs. Montreal dealers are exporting steel scrap to Britain. Dealers are out of the market and prices are steady.

Iron Ore

Iron Ore Prices, Page 56

Cleveland—In the absence of further sales of Lake Superior iron ore interest in the market is centered on the trend in shipments. The number of vessels actively engaged in the ore trade June 15 was 139, compared with 40 on May 15. The total number of vessels in the Great Lakes fleet is 328, and 188 of these are in commission, though, as indicated, not all are carrying iron ore. Iron ore stocks at lower lake ports and furnaces are nearly 3,000,000 tons less than a year ago, as shown by the following from the Lake Superior Iron Ore association:

	Tons
Consumed in April	2,470,121
Consumed in May	2,957,934
Increase in May	487,813
Consumed in May, 1933	1,265,623
On hand at furnaces June 1, 1934	21,218,303
On Lake Erie docks June 1, 1934	4,379,795
Total at furnaces and Lake Erie docks June 1, 1934	25,598,098
Total June 1, 1933	28,314,417

Ferroalloys

Ferroalloy Prices, Page 56

Current prices on domestic spiegeleisen, 19 to 21 per cent, have been extended by the leading producer for third quarter. These prices are $26, furnace, on lots up to 50 tons, and $24 on 50 tons and over. Ferromanganese sellers are receiving contracts for third quarter at the unchanged price of $85, duty paid, Atlantic and Gulf ports. Specifications on both products have begun to lag, following a fairly brisk movement earlier in the month.

Nonferrous Metals

Nonferrous Metal Prices, Page 56, 57

New York—Demand for nonferrous metals was generally slower last week. Despite this, market sentiment appeared improved.

Copper—Consumers placed orders for only a few hundred tons daily, reflecting the heavy coverage which took place just prior to the advance to the 9-cent level. The foreign market was slightly easier with sales made at under 8.00c, c.i.f. European ports. This had a slightly reactionary effect on the scrap market since refinery intake equivalents are figured on the basis of 50 per cent of the blue eagle price and 50 per cent of the non-blue eagle or export price. The copper code authority apparently is obtaining a firmer grip on the metal. It is expected that consumers who bought heavily prior to the time the code went into effect will be forced to buy three parts of blue eagle copper to go with one part of the metal held. Only about 1 per cent of the copper now moving is blue eagle. H. O. King has been relieved of his duties as divisional administrator with the NRA to take the position of director of the copper code. King told purchasers in convention at Cleveland last week that a further rise in copper is inevitable since few producers are able to turn a profit at 9.00c. The ban on non-blue eagle copper has been extended to Sept. 30.

Lead—Sales subsided but the market retained a steady appearance on the basis of 3.85c, East St. Louis, and 4.00c, New York. Considerable business remains to be placed for July consumption.

Zinc—Prices held at the lower levels reached more than a week ago. Some sellers were out of the market. Fair business is reported to have been done on a price average basis. The market reflects to some extent the fact that the steel strike threat has not been entirely removed. A seasonal decline in galvanizing is seen over the next two months. Strikes at the plants of the Hegeler Zinc Co. and the Matthiesen & Hegeler Zinc Co. have been settled.

Tin — Professional activity predominated in the tin market. Straits

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metal was available at 51.00c and lower. Consumer buying was light.

Antimony—Trading was confined to small lots but prices took on a slightly firmer tone.

Aluminum—Prices were steady except for shading in No. 3 grade of No. 12 remelt. Demand was quiet.

Refractories

Refractories Prices, Page 56

Pittsburgh — Third quarter prices on refractory brick have been announced without change as follows, f.o.b. Pennsylvania works, for first-quality brick: Fire clay, $45; silica brick, $45; and malleable bung brick, $50. Second-quality fire-clay brick has been announced at $40, Pennsylvania works, and it is reported that net ton prices on magnesite and chrome have been reaffirmed at $65 and $45 per ton, respectively.

Coke By-Products

Coke By-Product Prices, Page 55

New York—Shipments against naphthalene contracts have slackened and the bulk of business is now spot buying which is active at unchanged prices. Industrial inquiry for phenol has improved. The bulk of distillate production is going directly to consumers with toluol and xylol still active. Prices are unchanged.

Quicksilver

New York—Quicksilver prices are unchanged. Small lots $75.50, a virgin flask of 76 pounds, and round lots $74.50. Better inquiry is noted.

Steel in Europe

Foreign Steel Prices, Page 58

London—(*By Cable*)—Great Britain's balance of foreign trade in May was the best in several months. Exports of steel and iron products were 190,575 tons, compared with 165,164 tons in April, a gain of 25,411 tons. Imports in May were 123,212 tons, compared with 125,324 tons in April, a decrease of 3112 tons.

Reorganization of the Welsh tin plate trade is proceeding and Mellingriffith & Co. Ltd., a large producer of tin plates at Cardiff, Wales, has been absorbed by Richard Thomas & Co. Ltd., another large interest.

Some seasonal decline is noted in demand for steel products but markedly less than had been expected. The sheet trade continues slow and demand for semifinished still is quieter.

The Continent reports light export business. Belgium has booked some orders for steel bars from Egypt, and Germany has sold some special steel to Japan and hoops to America.

Pacific Coast

Pacific Coast Prices, Page 55, 56, 58

San Francisco—(*By Air Mail*)—Award of 18,000 tons of steel plates for the San Francisco bay pipe line crossing for the Hetch Hetchy water project is the most important feature of the week in the steel and iron market. Western Pipe & Steel Co., San Francisco, was awarded 13,000 tons and American Concrete & Steel Pipe Corp., Los Angeles, 5000 tons.

Ending of the strike of stevedores June 18 relieved a situation that threatened to close all metalworking plants on the Coast.

Soule Steel Co. booked 275 tons of reinforcing for a sewer in San Francisco and 100 tons for Los Angeles county.

Moore Drydock Co., Oakland, Calif., secured 750 tons of shapes for the Sacramento river bridge at Redding, Calif. Consolidated Steel Corp. took 185 tons for a plant addition at Torrence, Calif., for Columbia Steel Co. The former company also booked 188 tons for two bridges in California for the Southern Pacific Co. Bids will be opened July 9 for 2000 tons of sheet steel piling for the Fort Peck dam in Montana. Bids have also been taken on 500 tons for 17 cranes for Boulder dam, Boulder City, Nev.

Awards of plates were the largest of any week so far this year and exceeded 18,000 tons. Western Pipe & Steel Co. is low on 250 tons of welded steel pipe for Los Angeles. Bids have been taken on 140 tons of black sheets for Oregon license plates. Bids open June 30 for 100 tons for a pipe line at La Mesa, Calif.

On the largest cast iron pipe inquiry of the year, 9300 tons for San Francisco, United States Pipe & Foundry Co. was low on 5700 tons;

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American Cast Iron Pipe Co. on 1500 tons and the National Cast Iron Pipe Co. on 2100 tons. Bids have been opened on 160 tons for South Pasadena, Calif.

Public Works in Lead

Seattle—Bids for the power house and navigation locks at the Bonneville dam, Oreg., estimated at $3,500,000, have been called for July 6 by Maj. C. F. Williams, United States district engineer at Portland, Oreg. This unit involves 12,128 tons of shapes. This will be the highest single lock lift in the world, with a rise of 65 feet at low water. The lock will be 516 feet long, 76 feet in width with walls 91 feet high in the chamber. The powerhouse will be 550 x 300 feet.

Silas Mason Co. Inc., New York, and Walsh Construction Co., Davenport, Iowa, have been awarded at $7,311,940, the contract for the tunnels at the dam site, Fort Peck, Mont. For the same project, Schulman Electric Co., Chicago, was low bidder at $378,478 for copper and aluminum cables for the distribution system for the dredges.

Bids will be opened at Spokane, July 2, for the water and sewer system at the Grand Coulee project. This includes reinforcing copper service pipe and 20,410 feet of 3 to 8-inch cast iron pipe and fittings. Materials will be furnished by the government. David H. Ryan has been awarded the contract for construction of the railroad extension to Coulee.

For third quarter mill prices of reinforcing and merchant bars are advanced 3.00c, the new prices being 2.75c and 2.60c, respectively. Shapes and plates are unchanged at 2.40c.

The scrap market is inactive, prices unchanged, the movement being practically stopped due to inability of operators to keep their ships in service.

Production

(*Concluded from Page* 12)

July. Need for replenishing raw steel stocks may serve to cushion the decline, however.

Chicago—Declined 7 points to 63 per cent, while 14 of 36 steelworks blast furnaces continued in production. Some mills will cut steelmaking operations in half next month following the completion of shipments against old contracts this week.

Detroit—Remained at 82 per cent last week, 14 out of 17 open hearth furnaces continuing to make steel.

Pittsburgh—Unchanged at 56 per cent last week, this high rate of activity being supported mainly by operations of a leading producer whose rate was advanced to almost 60 per cent. On the other hand, a few small independent mills began taking off open-hearth furnaces last week and it is expected that the larger producers will share in this trend this coming week, so that a decline in operations is probable.

Twenty-six out of 60 stacks continue in blast and no additional blast furnaces are expected to be either blown in or out for the next two weeks. Individual blast furnace rates are as follows: Carnegie Steel Co., 10 of 32, Jones & Laughlin Steel Corp., 6 of 11, Bethlehem Steel Co., 5 of 7, National Tube Co., 2 of 4, and 1 of 2 each for American Steel & Wire Co., Pittsburgh Crucible Steel Co., and Pittsburgh Steel Co.

Buffalo—Dropped 11 points last week to 47 per cent due to four open hearths being withdrawn from production. This rate is likely to be continued this week. Further curtailment is anticipated as the new quarter approaches. Eighteen out of 38 open hearths are active in this district.

Birmingham—Continued at 55 per cent for the fifth consecutive week. Five open-hearth furnaces are in operation at Ensley, and 13 and 14 open hearths in this district are still active.

Wheeling—With 31 out of 39 open-hearth furnaces here actively scheduled last week, steel production for the district continued at 81 per cent, and no change is expected this week.

¶Daily average production of steel sheets by independent makers in May increased to 8275 net tons from 7150 tons in April; shipments increased to 7765 tons from 6134 tons, while sales decreased from 9080 tons in April to 7945 tons in May, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. May totals follow: Sales, 246,315 tons; production, 256,537 tons; shipments, 240,730 tons. Total sheet capacity in the United States for May was approximately 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

¶Final bureau of mines production statistics on the coke industry for 1933 are: 26,678,136 net tons of by-product coke valued at $120,312,324; 877,242 tons of beehive coke valued at $2,531,703; 2,533,381 tons of by-product screenings or breeze; 45,932 tons of beehive screenings or breeze. Coal charged into by-product ovens, 38,680,937 net tons valued at $130,891,297; into beehive ovens, 1,408,181 net tons valued at $1,861,616. Average yield of coke charged into by-product ovens 68.97 per cent, into beehive ovens 62.30 per cent. No change developed in the number of by-product ovens—13,053; but 2733 beehive ovens

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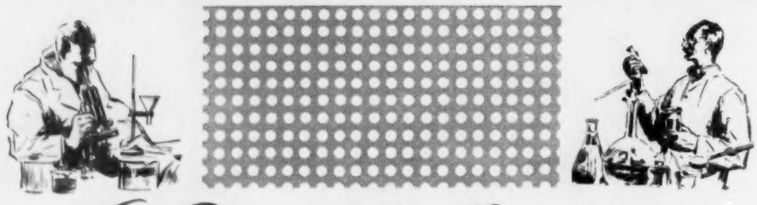

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¶The Amalgamated Association of Iron, Steel and Tin Workers' convention a week ago Friday night closed at 10:30 p. m. The place, fifth floor of the Elks' hall, an old brick building down near Pittsburgh's Allegheny river waterfront. The threat of a steel strike for the morrow, June 16, had just been averted, delegates who had just voted not to strike but to back William Green's plan of proposed mediation, were being handed envelopes with their expenses :

"Of course there were some dissenters, but they hardly made a murmur."—Michael F. Tighe, president of the Amalgamated, commenting on the vote of no strike by 188 delegates sent by lodges from leading steel centers.

"The convention has acted and I'm satisfied."—William J. Long, Weirton leader and formerly loud proclaimer for a strike.

"Well, the majority wanted this and we'll go along with the majority."—Earl J. Forbeck of McKeesport, Pa., a ringleader of the rank-and-file faction.

Steel Code

STEEL code amendments which became effective June 11 rendered ineffective or unnecessary certain resolutions previously adopted and made necessary some changes in others. Hence, in rescinding resolutions no longer effective or necessary and in making changes in others, the American Iron and Steel institute has consolidated some of the resolutions now in effect and has renumbered all of the resolutions consolidated or revised.

This policy has resulted in the issuance of new commercial regulations No. 4 and 26 commercial resolutions, the latter numbered A1 to A26, most of which were effective June 21.

In addition, new resolutions numbered A27 and A28, respectively, became effective June 21.

The resolutions which have been superseded by the amendments to the steel code, effective June 11, and which were formally rescinded on June 14, comprise resolutions Nos. 1, 2, 3, 4, 14, 15, 19, 21, 25, 26, 28, 31, 33, 34, 36, 40, 45, 53 and 57.

Regulation No. 4, which supersedes several others, relates to reductions in delivered prices on steel products shipped whole or in part by water transportation and to reductions in delivered prices of products sold for delivery in the South Atlantic, Gulf or Pacific Coast states, and to transportation charges on products sold for delivery at places in the Canal Zone, or at ports in Alaska.

Revised resolutions Nos. A1 to A26, all effective by June 21, provide mostly minor changes in the resolutions which they supersede. The new resolutions are:

A1, heretofore known as resolution No. 5, protects pipe jobbers against mill price declines on such tonnages as they may have purchased within 60 days and still have on hand.

Sets Minimum Interest Rate

A2, superseding resolution Nos. 9 and 32, establishes 6 per cent per annum as the minimum interest that can be charged and collected on invoices remaining unpaid after the expiration of the period of free credit; and permits waiver of interest not exceeding 99 cents in the aggregate on invoices paid by the purchaser in any month.

A3, superseding No. 16, establishes fixed minimum allowances for truck deliveries to places not reached by all-rail transportation.

A4, superseding resolutions No. 20 and No. 52, fixes arbitrary switching charges to be added to base prices for products delivered at basing points.

A5, superseding commercial resolution No. 22, allows reductions from

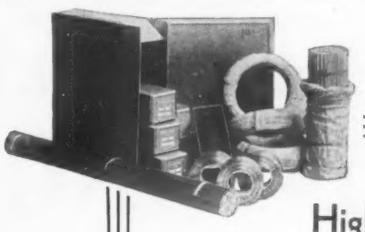
Convention Calendar

June 25-28—American Society of Mechanical Engineers. Semiannual meeting at Cosmopolitan Hotel, Denver. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

June 25-29—American Society for Testing Materials. Thirty-seventh annual meeting at Chalfonte-Haddon hall, Atlantic City, N. J. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

June 25-29—American Institute of Electrical Engineers. Annual summer meeting at The Homestead, Hot Springs, Va., H. H. Henline, 33 West Thirty-ninth street, New York, is secretary.

June 28-29—Open Hearth Committee, American Institute of Mining and Metallurgical Engineers. Seventeenth conference at Hotel Schenley, Pittsburgh.



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base prices of products sold for an identified construction project pursuant to quotations therefore to remain good for 60 days after an increase in the base prices for such products.

A6, supplanting resolution No. 23, rules that a code member, providing he adheres to certain code stipulations, may, in selling here the product of a foreign subsidiary, draw up a job agreement which will not be subject to the special provisions which usually govern where imported steel is involved.

A7, heretofore known as resolution No. 24, provides that any code member selling a product in intrastate commerce within the states of California, North Carolina or Oregon may allow purchasers a deduction from the base price not exceeding the amount of the sales tax payable upon the sale of such products in these respective states.

Deductions to Railroads

A8, superseding resolutions No. 28, No. 29, No. 50 and No. 54, covers reductions in the delivered prices of products, and the allowances of freight charges thereon, to railroad companies and to trustees, mortgagees and lessors for use in the manufacture of railroad equipment and to jobbers for direct shipment to railroads or trustees, mortgagees and lessors.

A9, superseding resolution No. 30, relates to the allowance of discounts for the early payment of invoices, and allows for a deduction from the base price, provided the invoice is paid in the period intervening between the expiration of 10 days from the date of such invoice and the expiration of 10 days from the date of the dispatch of the invoice and provided that invoice is paid within not more than 15 days after the date of the invoice.

A10, heretofore known as resolution No. 39, defines an agency agreement and stipulates that each code member must file all agreements with agencies with the Institute for approval, where this has not already been done.

A11, heretofore known as resolution No. 41, stipulates that the price of any product that has not previously been included in the base price list of a member must first, upon being filed, be approved by the Institute before it can become effective.

Pipe Concessions Revised

A12, superseding resolution No. 42, permits deductions from the base prices of pipe and other tubular products on sales to other manufacturers of such products for resale. Provided the original seller secures a written agreement from the buyer whereby the latter will not, without approval of the Institute board, directly or indirectly through any concern in which he may be substantially interested, sell to a third party at prices or on terms or conditions more favorable than those permitted other producers in selling such third party under code provisions, and provided the purchaser agrees to subject himself to fine for violation.

A13, superseding resolution No. 44, fixes the allowance of freight charges on products sold to the United States government or to its departments or divisions, and rules on reductions on the delivered price of the price so sold.

A14, heretofore known as resolution No. 48, treats with agreements for the conversion of materials into products by code members for other parties.

A15, superseding resolution No. 49, instructs as to the stamping of bills of lading and shipping orders to prevent reconsignments of products without consent of the code members selling such products.

A16, superseding resolution No. 51, contains further regulations with respect to the plates, shapes or bars for fabrication for an identified structure.

A17, superseding resolution No. 59, resolves that any code member selling steel fence posts in less than carlot quantities, may allow purchasers certain stipulated reductions in the delivered price.

A18, superseding resolution No. 8, authorizes reductions in the delivered prices for products delivered by truck provided by the purchaser.

A19, superseding resolution No. 35, covers reductions in the delivered prices for products in the delivered prices for products in less than carlot quantities in certain cases where the purchaser takes delivery at a warehouse or railroad freight station.

Allowances for Carlots

A20, superseding resolution No. 12, deals also with reductions in the delivered prices for products sold in less than carlots.

A21, superseding resolution No. 13, covers reductions in the delivered prices for certain products sold for delivery at points in or about Detroit and at certain points in Ohio and Pennsylvania.

A22, heretofore known as resolution No. 46, governs quantity differentials on sales of merchant bars in quantities of less than 2000 pounds for delivery at points in Colorado, Montana, New Mexico, Utah and Wyoming.

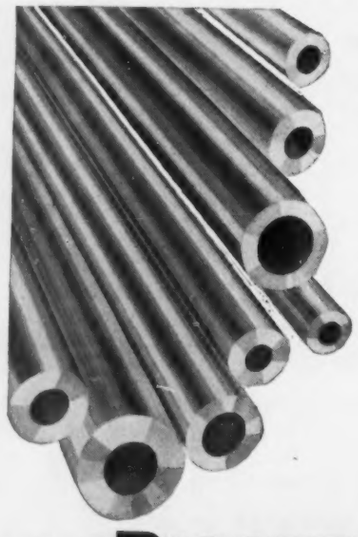
A23, superseding resolution No. 18, authorizes certain deductions from the base price for southern foundry pig iron, predicated on the phosphorus content of the iron.

A24, superseding resolution No. 55, deals with reductions from base prices for wrought iron pipe.

A25, superseding resolution No. 27, relates to deductions from base prices for standard pipe, waterwell casing and large outside diameter pipe.

A26, heretofore known as resolution No. 17, declares that any person, firm, association or corporation which qualifies as a jobber of tool steel in all respects, except that it does not as a rule purchase in car lots, such interest may nevertheless be deemed to be a jobber.

A27, is a new resolution which became effective June 21 and covers a reduction in the delivered price for tool steel sold in a quantity not in excess of 30 pounds for delivery at a point west of the Mississippi river



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and shipped by parcel post or by express.

A28, is also a new resolution which became effective June 21. It deals with reductions from the base prices for stainless steel products.

Purchasers Discuss Price Policies

(*Concluded from Page 20*)

tary, American Iron and Steel institute, explained the purport of recent modifications of the steel code. These, he said, will still further insure the free play of competition within the industry and operate chiefly in the interests of the purchaser.

"It seems probable that under the amended code fewer contracts may be made than in the past," he stated. "As a contract is no longer necessary to protect the buyer on price the need for a contract from the buyer's viewpoint may arise chiefly from his desire to insure delivery."

Walter S. Doxsey, editor *Daily Metal Trade*, Cleveland, analyzed the market situation in steel.

"If the consumption of steel had been maintained at the progressively increased rate enjoyed during the first 30 years of this century the accumulated deficiencies of the four years of the depression would amount to approximately 140,000,000 tons," he said.

"However, if the past four years have taught us anything they have emphasized the fallacy of accepting such superficialties drawn from previous experience."

He cautioned against basing future hopes on such figures.

"Thousands of new products have engendered a diversified demand for steel that has been amazing to the steel producers time after time during the depression," he said.

Plea for Middle Men

Frank D. Bryant, purchasing agent for the Standard Oil Co. of California, advocated the spreading of business among "the firms in your community" to carry out the spirit of the NRA. If the positive benefits under the codes are to be sustained, such as the abolishment of child labor and the paying of reasonable wages to labor, purchasers should not attempt to "chisel" and to eliminate middle men.

Uniform prices resulting from the codes are "a good thing," Fred G. Space, purchasing agent, Seymour Mfg. Co., Seymour, Conn., told the convention. He said that reasonable competition can be carried on under the codes, and this will be manifest more and more in quality and service. "Within another year," he said, "many of the present codes will hardly be recognizable."

British purchasing agents were represented by Leonard H. Swinbank, controller of purchases for the Imperial Industries Ltd., London. He said that a general rise in world prices, re-establishment of an international monetary system, and practical steps to hold in check the excesses of economic nationalism will be necessary for restoration of world prosperity. If the American policy of raising prices continues with success, the British government will soon give serious consideration to returning to the gold standard, he predicted.

Charges Lack of Definite Plan

An answer to some of the NRA deputies' criticism of industries came Thursday in the closing session of the convention when Dr. Lewis H. Haney, professor of economics, New York univeristy, New York, declared that lack of a definite plan by the administration is driving the country forward into further inflation.

"The so-called 'experimental approach' which Professor Tugwell assures us is so essential a part of the Rooseveltian policy stands for a complete lack of planning and is essentially similar to the speculation which wrecked us under the new era," he said.

"I advise business men to retain hedges against inflation, to spend freely in ways designed to build up their plants and equipment by advertising and developing good will."

One of the interesting features of the convention—and one of the few not related to NRA, codes and price policies—was an address by Dr. Harrison E. Howe, editor, *Industrial and Engineering Chemistry*, Washington, in which he told of the development of at least 800 new or greatly improved products in the past four years, which he referred to as "children of the depression."

Joseph B. Keenan, Cleveland, assistant United States attorney general, spoke briefly at the convention's banquet Wednesday night. He declared that the United States is the most lawless nation in the world, and made a plea for co-operation by municipal governments and citizens in the government's efforts to stamp out racketeering.

The government, he said, is doing its best, but cannot cope with the problem without more assistance. He cited statistics from 161 representative cities in the last few years to show that ten of every 100,000 persons died by violence.

The association decided to hold its 1935 convention a few days before the meeting of the American Iron and Steel institute in New York in May.

Equipment

Pittsburgh—Carnegie Steel Co., Pittsburgh, continues to keep active its inquiry for a wide strip mill similar to that recently purchased by the Younstown Sheet & Tube Co. from Mesta Machine Co. Carnegie is reported to be planning this new mill for a site which has been selected at its Ohio works, Youngstown, O., and although delays continue in the final release of funds from New York for this mill building, estimated to cost approximately $10,000,000, it is calculated that the mill could be in operation within eight to nine months

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after word to proceed was issued.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., received an order early last week amounting to nearly $1,000,000, its largest single order for steel mill electrical equipment since 1929. Work is for the Youngstown Sheet & Tube Co.'s new mill and includes six 3500-horsepower motors, control equipment, motor-generator sets and auxiliary units.

Chicago—With sales of various types of plant machinery and equipment continuing lighter than during May or April, there are indications that this business has entered a summer slump. Demand for miscellaneous small tools is fairly steady, reflecting only small changes in operations of metalworking plants, but business in heavier equipment is slower. Machine tool sellers are figuring on new inquiries from the navy, these being for eastern shops. Additional crane orders for various government dams are in prospect, including Fort Peck, Mont., and Mississippi river projects as well as two on the Pacific coast, but inquiries have yet to appear.

Boston—Demand for machinery and equipment shows little change, although some attractive foreign business has been placed for grinding and boring tools. Domestic demand is mostly for one or two tools at a time, but several machines in the recently closed Frankford, Pa., arsenal list were placed with New England shops. There has been some buying and inquiry for new tools for the automotive industry from the Detroit area.

New York—Inquiry for machinery and plant equipment is broader, but actual buying has improved but slightly. Specifications for several hundred machines for technical schools in the New York district are expected out soon. Tentative contracts for nearly $750,000 worth of operating equipment for the No. 2 water tunnel, New York, have been placed. Among the successful bidders were Hardie-Tynes Mfg. Co., Birmingham, Ala.; Bartlett-Hayward Co., Baltimore; Western Gas Construction Co.; Lecourtenay Co., Newark, N. J., and McKiernan-Terry Corp., Newark.

Cleveland—Inquiries for new machinery and equipment are scattered, with awards seasonally light. Rotary Electric Steel Co. (Michigan), Detroit, has purchased drawing blocks from the Vaughn Machinery Co., Cuyahoga Falls, O.; heating and annealing furnaces from Swindell-Dressler Corp., Pittsburgh; and overhead electric cranes from Cleveland Crane & Engineering Co., Wickliffe, O., for its new cold-rolled strip mill in Detroit. E. W. Bliss Co., Brooklyn, N. Y., is supplying the rolling equipment. Structural steelwork for the building is about completed.

Construction and Enterprise

Pennsylvania

DERRY, PA.—Plant of the Milwood Repair & Supply Co., Derry, Pa., was damaged by fire recently. Loss included a large quantity of machinery stored in the company's warehouse which also was destroyed.

ERIE, PA.—B. J. Lechner, secretary of the commissioners of waterworks, is taking bids for furnishing f.o.b. Erie one 1400-gallon per minute motor-driven centrifugal pump. J. S. Dunwoody is superintendent of waterworks.

PHILADELPHIA Frankford Arsenal will receive bids June 28, contract 34-634, for universal adjustable high-speed milling attachment.

PHILADELPHIA—Navy department, Washington, has been allotted $2,700,000 by PWA for expansion of the naval aircraft factory at Philadelphia.

PHILADELPHIA—Harry A. Robinson, Morris building, has purchased 12 buildings formerly used by the Cramp Brass & Iron Foundries Co., with about 100,000 square feet of floor space.

PHILADELPHIA — Air Reduction Sales Co., Germantown and Allegheny avenues, is building a plant addition to cost about $28,500. General contract has been awarded to William Steele & Sons, Market Street National Bank building, Philadelphia.

PITTSBURGH—Independent Bridge Co. expects to build a river-rail transfer on the left bank of the Ohio river at its Neville Island plant near Pittsburgh.

SHARPSBURG, PA.—Fort Pitt Brewing Co. is doubling the capacity of its brewery and adding much equipment, at cost of about $210,000.

New England

MOODUS, CONN.—Haddam Distillers Corp., David L. Nair, treasurer, is increasing its capitalization and will enlarge its facilities.

CAMBRIDGE, MASS. — Kendall Boiler & Tank Co. has been formed by Frank J. Holderried, 275 Third street, to manufacture boilers, tanks and plate products.

SOUTH BOSTON, MASS.—White Fuel Corp., 888 East First street, will let contract soon for a coal-handling plant, to cost about $75,000. G. P. Carver, 62 Dane street, Beverly, Mass., is architect.

PORTSMOUTH, N. H. — Frank Jones Brewing Co. will rebuild its burned plant, four stories, at cost of about $80,000.

New York

NEW YORK—Baird Daniels Co. Inc., 36 Front street, will expend about $60,000 for buildings and equipment in extensions and improvements to its plant at Warehouse Point, Conn.

NEW YORK—Wells Architectural Iron Co., 643 Riverton avenue, has leased manufacturing space at Lincoln avenue and East 133rd street.

New Jersey

BURLINGTON, N. J.—United States Pipe & Foundry Co. is equipping its No. 3 shop here for the manufacture of cast iron roof plates. Some of the equipment is coming from its Scottdale, Pa., plant.

CAMDEN, N. J.—City, Frank B. Hanna, director of public affairs, City hall, has had $8,000,000 loan approved by PWA for municipal light and power plant.

PASSAIC, N. J.—Swan Mfg. Co. has been formed with $100,000 capital to manufacture valves, hydrants and other products, by Joseph Wilson, care David B. Kaplan, 657 Main avenue.

Ohio

CLEVELAND—Salmar Corp., N. E. Polster, president, recently incorporated, has leased plant of the United States Rubber Co. at Lisbon road and Evans avenue, Southeast, to operate a distillery. Alterations are under way and distilling equipment will be installed at a cost of about $90,000.

DAYTON, O.—Inland Mfg. Co., Wallace S. Whittaker, president, subsidiary of General Motors Corp., is planning to erect a two-story factory and office building, 150 x 414 feet, to accommodate increase in business.

HUBBARD, O.—Powell Pressed Steel Co., manufacturer of automobile fenders and other sheet metal products, will rebuild its burned plant, about $40,000.

NORWALK, O.—Machine shop and office building of the Norwalk Foundry Co. recently was damaged by fire.

SANDUSKY, O.—Sandusky plant of the City Ice & Fuel Co., of Cleveland, recently was damaged by fire which broke out in the manufacturing department.

TROY, O.—Hobart Cabinet Co., manufacturer of sheet metal products, cabinets and similar devices, will rebuild burned portions of its plant, about $80,000.

WARREN, O.—American Welding & Mfg. Co. has plans in progress for rebuilding its main plant recently destroyed by fire, including machinery and equipment. The company manufactures welded steel specialties. (Noted June 18.)

Michigan

DETROIT—National Steel Furnace Co. has been incorporated by Howard B. Lawton, 10040 Freeland avenue, to manufacture furnaces.

DETROIT—Accurate Tool & Die Co., Joseph Campau avenue, will build a 1-story unit 60 x 150 feet to cost about $30,000, including equipment.

DETROIT—Gasket Mfg. Co. has purchased plant of the Peninsular Stove Co., Brightmoor, Mich., and will move its factory on East Milwaukee avenue to the Brightmoor site. Improved business and the need of more operating space is given as reason for change.

DETROIT—Rotary Electric Steel Co. (Michigan) has just completed erection of structural steel for its first building, approximately 60 x 700 feet. The new building will house cold-rolled

strip mills to be supplied by the E. W. Bliss Co., Brooklyn, N. Y., drawing blocks by Vaughn Machinery Co., Cuyahoga Falls, O., heating and annealing furnaces by the Swindell-Dressler Corp., Pittsburgh, and overhead electric cranes by the Cleveland Crane & Engineering Co., Wickliffe, O.

DETROIT—Star Tool & Die Works, 2532 Twenty-fourth street, has awarded contract to W. J. C. Kaufmann, 10610 Shoemaker street, for an addition to its factory.

FLINT, MICH.—A-C Spark Plug Co., division of General Motors Corp., will build a 1-story addition 45 x 250 feet at cost of about $65,000, for manufacture of bearings. General contract is let to Karl Foster Inc., Flint, Mich.

HOLLAND, MICH.—Gillboat Corp. is planning to expend about $40,000 for alterations and equipment for the plant formerly occupied by the Ottawa Furniture Co., Holland.

HOLLY HILLS, MICH.—Holly Hills Distillery Co. is building a distillery by separate contracts, to cost $30,000. G. A. Bachman, Flint, Mich., is engineer.

JACKSON, MICH.—Riverside Forge & Machine Works will build a 1-story addition to its forge shop 40 x 60 feet.

NILES, MICH.—Simplicity Pattern Co. is planning to erect an addition to its factory building.

NORTHVILLE, MICH.—An election will be held soon on bonds for a PWA loan of $21,000 for a municipal waterworks, including a covered reservoir.

PLYMOUTH, MICH.—Plymouth Felt Products Co., Plymouth, is having plans prepared by I. M. Lewis Inc., 816 Ford building, Detroit, for one-story factory building, 15 x 135 feet.

PORT HOPE, MICH.—Village clerk will take bids shortly for waterworks project to cost about $23,000. PWA funds have been granted for the work.

SAGINAW, MICH.—Smith Agricultural Chemical Co., Columbus, O., is planning to construct a plant, 175 x 300 feet, on the Pere Marquette railway and Holland avenue, near city limits of Saginaw.

Indiana

BEDFORD, IND.—Bids will be received until June 26 by H. S. Murray, mayor, for construction of a municipal waterworks system. C. A. Brossman, Chamber of Commerce building, Indianapolis, is engineer.

GOSHEN, IND.—Bids will be received until July 2 by C. E. Firestone, mayor, for construction of a waterworks system, including a 500,000-gallon steel tank on steel tower, pumps, mains and hydrants, to cost about $150,000.

INDIANAPOLIS — Capital Valve Corp., 8 East Market street, has been incorporated by Harry S. Burke, Hurshal E. Parker and Willard A. Anglmyer, to manufacture air pressure valves and automobile accessories. George M. Barnard is resident agent.

MUNCIE, IND.—Muncie Gear Co. has begun the production of coal stokers for boilers and furnaces in addition to its present line of outboard motors and power lawn mowers.

Illinois

CHICAGO—Mercury Mfg. Co., 4118 South Halsted street, is planning to construct a one-story machine shop to cost about $41,000. A. Epstein, 2001 West Pershing road, Chicago, is architect.

CHICAGO — Pebbleford Distillery Co., 224 South Michigan avenue, has been organized by Sigmund Rubin, Samuel Pollack and Dave Rubin, to operate a distillery. Correspondent: Israel Dordek, 39 South LaSalle street.

CHICAGO—Hanna Metal Products Co., 9 South Clinton street, has been formed by Charles L. Sigman, Ellsworth J. Hanna and Wellington W. Brothers, to deal in metals and metal products. Correspondent: Louis S. Feinn, 163 West Washington street.

CHICAGO—Mount Hope Distilleries Inc., 39 South LaSalle street, has been incoroprated by J. S. Pierce, Arthur J. Goldberg and Frances Swikler, to manufacture and distill alcoholic beverages. Correspondent: Joseph B. Lawler, 1 North LaSalle street.

CHICAGO—Imperial Die Casting Co., 4707 West North avenue, has been incorporated by Phillip H. Schoefield, John Paulding Brown and M. Ogden West, to deal in metals. Correspondent; M. O. West, care of Cutting, More & Sidley, 11 South LaSalle street.

CHICAGO—Reliance Elevator Mfg. Co., 1400 West Adams street, has been incorporated by W. C. Davis, Carl Anderson Jr., and Warren B. Eshbach, to engage in manufacture of elevators and escalators, conveyors, machinery and equipment. Correspondent: W. C. Davis, 1400 West Adams street.

EDWARDSVILLE, ILL.—City is having plans made for a sewage disposal plant and auxiliary piping, to cost about $168,000. A PWA loan has been asked. W. H. Morgan is city engineer. Morgan & Schwab, Alton, Ill., are engineers.

District of Columbia

WASHINGTON—Bureau of yards and docks, navy department, will receive bids June 29, schedule 2775, for precision lathes (quick change gear), for delivery at Washington.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids June 28, schedule 2770, for one motor-driven toolmakers' precision lathe, delivery Brooklyn, N. Y.; July 3, schedule 2792, one automatic welding outfit, delivery Brooklyn, N. Y.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids July 3, schedule 2786, on motor-driven drilling machines, delivery at Newport, R. I.; schedule 2805, one motor-driven, universal, cutter and tool grinder, delivery Brooklyn, N. Y.; July 6, schedule 2813; two motor-driven horizontal boring mills, delivery Washington; July 10, schedule 2812, two motor-driven, screw and bar, automatic, multiple spindle type machines, delivery Washington.

Florida

TAMPA, FLA.—DeSoto Brewing Co., Dan Arias, president, has acquired

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STRETCHER LEVELLER—48″ x 12′ HYDRAULIC, DC Motor Drive with motor and triplex pump.
LATHES—26″ x 16′ BRIDGEFORD Geared Head, Single Pulley Drive with Taper Attachment.
PLANER—30″ x 30″ x 10′ LIBERTY AC Motor Drive with motor and starter, 2 rail heads, power rapid traverse.
DRILL—5′ CINCINNATI-BICKFORD RADIAL, Motor Drive with AC motor and starter.
SHAPER—32″ COLUMBIA arranged for direct connected motor drive with motor.
PRESSES—No. 6-1/2 BLISS STRAIGHT SIDE DOUBLE CRANK with spring counterbalance, belt drive, 54″ bet. housings, 8″ stroke.
SHEAR—No. 10 BUFFALO for bars and shapes. Capacity up to 3-7/8″ rounds and corresponding duty in shapes. Direct connected AC MD with motor.
TESTING MACHINE—150,000 lb. TINIUS OLSEN Vertical Screw Power, Belt Drive, three rotating screw type.
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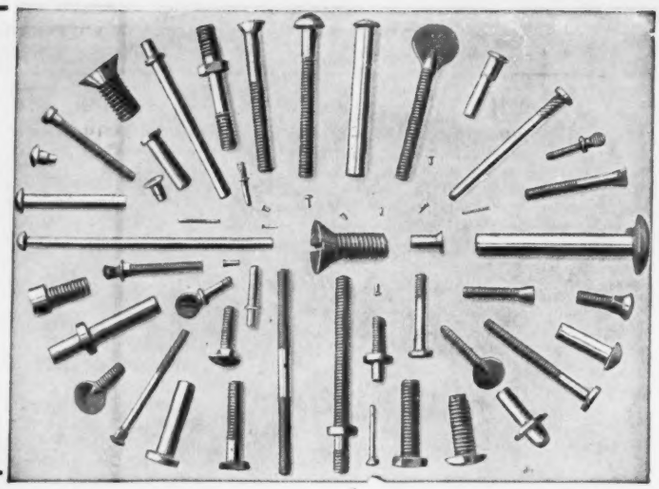

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The scope of the work may be inferred from the 15 chapter headings which include: Facts About the Steel and Iron Base and Iron Oxides and Scale; Acids, Bath Temperature and Pickling Time; Steam, Air and Agitation; Solutions, Tanks and Contaminations; Equipment and Production Principles; Compounds and Inhibitors; Fumes, Ventilation and By-Products; Chemistry of Pickling; Design and Construction of Pickling Tanks; Design of Pickling Departments; Pickling Steel and Copper for Tinning; and, Pickling for Zinc and Lead-Coated Sheets.

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building in West Tampa which it will remodel and install machinery.

Kentucky

LOUISVILLE, KY.—Old Mountaineer Distilling Co. has been incorporated by M. H. Reiger and Harry Blum.

LOUISVILLE, KY.—Kentucky Valley Distilling Co. has been incorporated with $100,000 capital by W. W. Lindsey, and A. J. Cummins, M. E. Taylor building.

STAMPING GROUND, KY.—Buffalo Distilling Co., Frankfort, Ky., has let contract to Howell & Goin Co., Frankfort, for storage and distributing plant at Stamping Ground to cost $60,000.

Louisiana

ALEXANDRIA, LA. — Commission council will receive bids July 17 for certain equipment, material and labor for improvement of municipal power plant, consisting of three 750-horsepower boilers with superheaters and accessories, three boiler feed pumps, two fuel oil heaters and pumps, etc. Plans have been prepared by I. W. Sylvester, city engineer.

Maryland

ANNAPOLIS, MD.—Incinerator committee of city council has approved specifications prepared by L. J. Houston Jr., Fredericksburg, Va., engineer for modern factory-type incinerator, and will open bids July 7. Approximate cost $40,000.

DUNDALK, BALTIMORE—Big Four Distilleries, recently incorporated, H. H. Klein, care of Potomac Distilling Corp., 2700 Wilmarco avenue, Baltimore, has acquired 14 acre tract as site for $500,000 distillery. Work is to begin soon.

OCEAN CITY, MD.—City is considering construction of incinerator.

North Carolina

DURHAM, N. C.—City has applied to PWA for additional $100,000 for sewage plant now under construction at Ellerbee Creek. Total cost of project is about $700,000.

ELKIN, N. C.—Morristown Mfg. Co., H. B. Meiselman, Morristown, Tenn., has leased plant of Biltrite Mfg. Co. here and will operate as Morristown Mfg. Co.

South Carolina

SUMTER, S. C.—Boyle Road & Bridge Co. has contract at $99,000 for extension to sewerage system including construction of pumping station and filtering plant.

Tennessee

KNOXVILLE, TENN.—City will call for bids about July 15 for first unit of proposed power distribution system. Burns & McDonnel Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., has engineering contract.

MEMPHIS, TENN.—United States engineer will receive bids June 29, serial 0-34-481, for machinery for marine ways, United States engineer supply and repair depot, including pinions, gears, forged steel shafts, bearings and bearing housings; serial 0-34-482, for six motor driving units and control equipment for marine ways.

NASHVILLE, TENN. — Vanderbilt university has appropriation of $15,000 for erection of brick office building and additional space for shops for mechanical and electrical engineering department.

PARSONS, TENN.—City has funds allocated for waterworks and sewer system and will soon call for bids. Freeland, Roberts & Co., Nashville, Tenn., are engineers.

West Virginia

BELINGTON, W. VA.—City, Earl Booth, clerk, will receive bids June 28 for constructing rapid sand filtration plant and necessary appurtenances.

WHEELING, W. Va.—Consolidated Expanded Metal Co., subsidiary of Wheeling Steel Corp., will build a 1-story plant 90 x 140 feet, for manufacture of expanded metal products.

Virginia

PORTSMOUTH, VA.—A new combined sheet metal and electrical shop has been authorized for the local navy yard. Construction of the building will entail expenditure of approximately $900,000.

Missouri

KANSAS CITY, MO.—Union Wire Rope Co., Twenty-first and Manchester streets, has let contract to John E. Redmond, Railway Exchange building, for additional buildings to cost $30,000.

ST. LOUIS—Heine Bolier Co., 5319 Shreve avenue, has been sold to the Super Heater Co., 60 East Forty-second street, New York, but will operate as one of a number of units of the Super Heater Co. in this and other sections of the United States.

Arkansas

TEXARKANA, ARK.—North American Car Corp., 327 South LaSalle street, Chicago, is planning to establish a shop here for building and repairing refrigerator, tank and poultry cars.

Texas

DALLAS, TEX.—W. H. King, Construction building, has contract for five-story and basement addition for Dallas Brewery and improvements to present building. Approximate cost $75,000.

HALLETTSVILLE, TEX.—City voted $23,000 bonds for erecting 150,000-gallon elevated steel water tank and extending distribution system. Has loan and grant of $7000.

HOUSTON, TEX.—Filtrol Co., 1755 Downey road, Los Angeles, G. Howard Hutchins, president, is considering establishment of a $300,000 plant in Houston to manufacture clay filtering products.

NORMANGEE, TEX.—City has completed plans for waterworks, including tower and distribution system to cost about $32,000. Culpepper & Flagg, Rusk building, Houston, Tex., engineers.

SAN ANTONIO, TEX.—Bexar county water control and improvement district will open bids July 5 for $115,000 sanitary sewer project.

Wisconsin

EAU CLAIRE, WIS.—Eau Claire Cold Storage Corp., C. W. Churchill, secretary, plans to rebuild refrigerator and storage plant at cost of $20,000.

Minnesota

ALBERT LEA, MINN.—Wilson Packing Co. is planning to rebuild its ice storage plant recently destroyed by fire.

HUTCHINSON, MINN.—City council, Paul Anderson, city clerk, will receive bids until July 2 for water distribution system, including 3900 feet of east iron water main.

MINNEAPOLIS—Campbell Machine Co., manufacturer of oil burners, oil-burning water heaters, boilers and radiation equipment, has just added 7000 square feet of floor space to its factory at 2845-51 Harriet avenue through the erection of a new building. The new factory addition is two stories, 40 x 87 feet. W. H. Campbell is president.

MOORHEAD, MINN.—City council, R. G. Price, city clerk, will receive bids until June 27 for sewage treatment plant to cost about $170,000, including lift station, collector sewer system, pump station, digester tank, etc. Buell & Winter Engineering Co., 503 Insurance Exchange building, Sioux City, Iowa, is engineer.

STEPHEN, MINN.—City has begun preliminary steps for construction of municipal light and power plant. J. F. Yetter is city clerk.

Iowa

DES MOINES, IOWA—Furlong Boiler Works, James Furlong, proprietor, 400 East Court street, is planning to rebuild 1-story boiler shop, 40 x 60 feet, destroyed by fire recently.

DES MOINES, IOWA—Construction of storage tank and plant alterations for Spencer Kellogg & Co., at Thirtieth street and Des Moines Union railway, is under way. Approximate cost is about $159,000.

OTTUMWA, IOWA—Lowe Foundry Co., 515 West Main street, has changed its name to the Ottumwa Foundry Co. C. B. Leedom is manager and L. L. Davolt is secretary and foreman.

SHENANDOAH, IOWA—City council will soon take bids for waterworks improvement to cost $125,000, including filtration plant and one mile of 10-inch pipe line. Allen & Vogtborg, 205 West Wacker drive, Chicago, engineers.

Pacific Coast Group

ABERDEEN, WASH.—Grays Harbor Pulp & Paper Co. is planning to construct 50-ton digester unit annex which will increase daily capacity of sulphite products from 100 to 150 tons. Estimated cost $100,000.

DAYTON, WASH.—Construction of the four buildings for the cannery plant of the Blue Mountain Canneries has begun under direction of Henry Robels, construction engineer. Production building, power house, and warehouse are included

TACOMA, WASH.—City's application for the first $250,000 of $1,000,000 PWA funds for water system extension is expected to be approved soon. Local officials have agreed on the second application for $317,000.

Dominion of Canada

PORT HOPE, ONT.—Nicholson File Co., Cavan street, will erect a 2-story plant addition 40 x 150 feet. Sproatt & Rolph, architects, 1162 Bay street, will take bids July 8.

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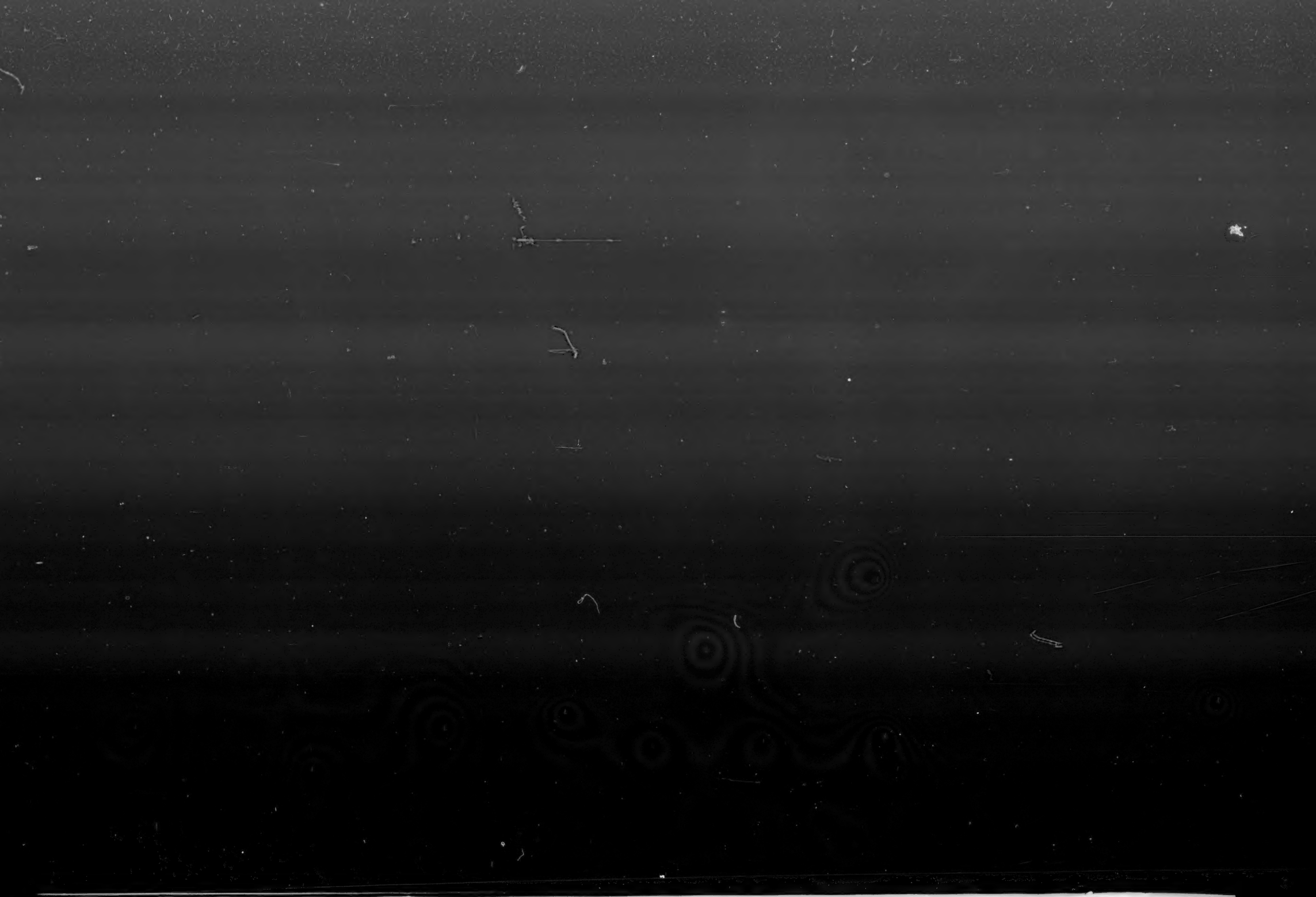
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